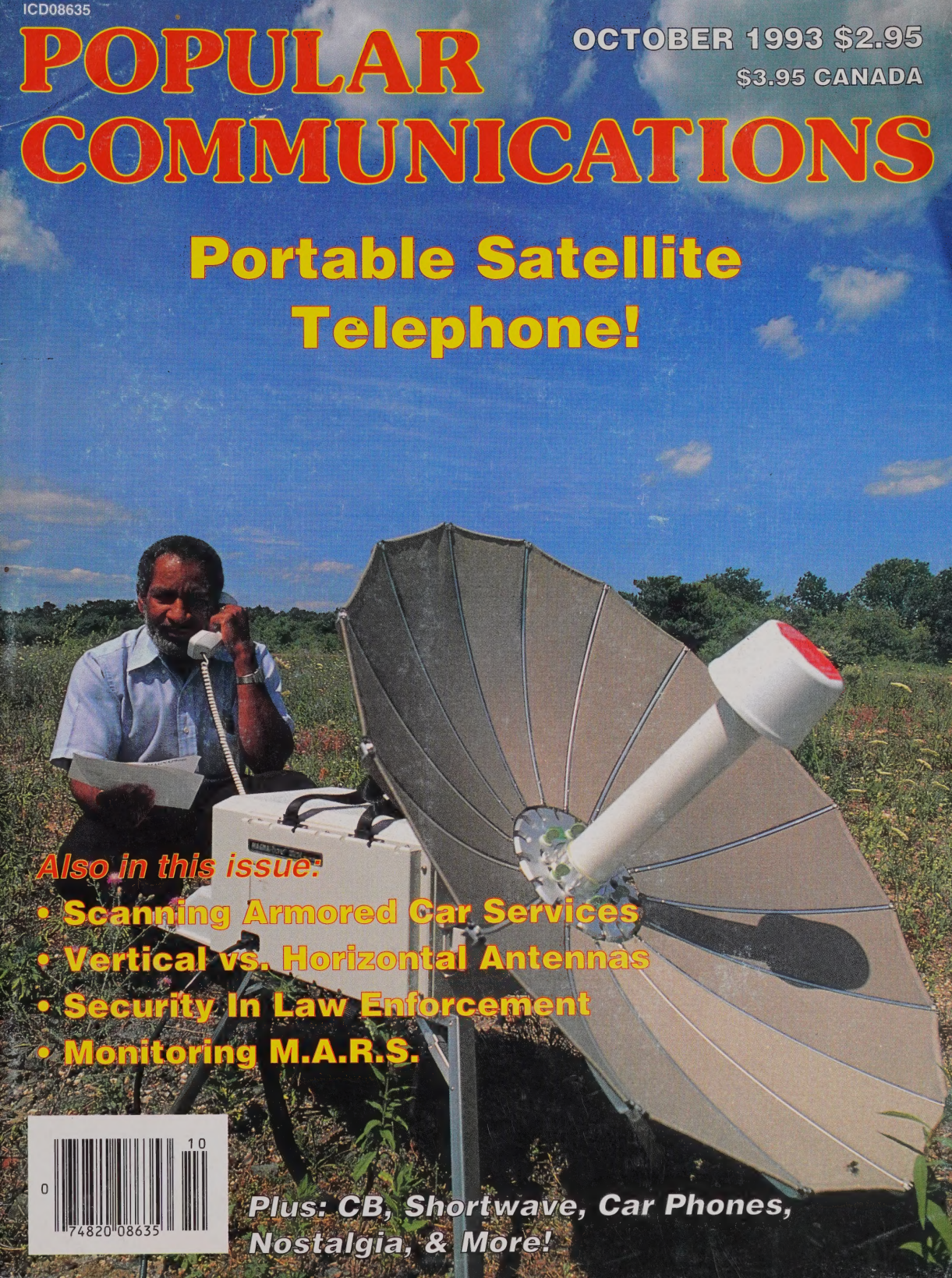
ICD08635

OCTOBER 1993 $2.95
$3.95 CANADA

POPULAR COMMUNICATIONS

Portable Satellite Telephone!



Also in this issue:

- Scanning Armored Car Services
- Vertical vs. Horizontal Antennas
- Security In Law Enforcement
- Monitoring M.A.R.S.

0 74820 08635 10

Plus: CB, Shortwave, Car Phones, Nostalgia, & More!

JRC NRD-535D

"Best Communications Receiver"

World Radio TV Handbook 1992

"Unsurpassed DX Performance"

Passport to World Band Radio 1992

Setting the industry standard once again for shortwave receivers, the NRD-535D is the most advanced HF communications receiver ever designed for the serious DXer and shortwave listener. Its unparalleled performance in all modes makes it the ultimate receiver for diversified monitoring applications.

Designed for DXers by DXers! The NRD-535D (shown above with optional NVA-319 speaker) strikes the perfect balance between form and function with its professional-grade design and critically acclaimed ergonomics. The NRD-535D is the recipient of the prestigious World Radio TV Handbook Industry Award for "Best Communications Receiver."

- Phase-lock ECSS system for selectable-sideband AM reception.
- Maximum IF bandwidth flexibility! The Variable Bandwidth Control (BWC) adjusts the wide and intermediate IF filter bandwidths from 5.5 to 2.0 kHz and 2.0 to 0.5 kHz—continuously.
- Stock fixed-width IF filters include a 5.5 kHz (wide), a 2.0 kHz (intermediate), and a 1.0 kHz (narrow). Optional JRC filters include 2.4 kHz, 300 Hz, and 500 Hz crystal type.
- All mode 100 kHz–30 MHz coverage. Tuning accuracy to 1 Hz, using JRC's advanced Direct Digital Synthesis (DDS) PLL system and a high-precision magnetic rotary encoder. The tuning is so smooth you will swear it's analog! An optional high-stability crystal oscillator kit is also available for ±0.5 ppm stability.
- A superior front-end variable double tuning circuit is continuously controlled by the CPU to vary with the receive frequency automatically. The result: Outstanding 106 dB Dynamic Range and +20 dBm Third-Order Intercept Point.
- Memory capacity of 200 channels, each storing frequency, mode, filter, AGC and ATT settings. Scan and sweep functions built in. All memory channels are tunable, making "MEM to VFO" switching unnecessary.
- A state-of-the-art RS-232C computer interface is built into every NRD-535D receiver.
- Fully modular design, featuring plug-in circuit boards and high-quality surface-mount components. No other manufacturer can offer such professional-quality design and construction at so affordable a price.

JRC Japan Radio Co., Ltd.

Japan Radio Company, Ltd., New York Branch Office – 430 Park Avenue (2nd Floor), New York, NY 10022, USA Tel: (212) 355-1180 / Fax: (212) 319-5227

Japan Radio Company, Ltd. – Akasaka Twin Tower (Main), 17-22, Akasaka 2-chome, Minato-ku, Tokyo 107, JAPAN Tel: (03) 3584-8836 / Fax: (03) 3584-8878

CIRCLE 78 ON READER SERVICE CARD

EEB NATIONS LARGEST SHORTWAVE DEALER

PHILLIPS DC-777 *Now SWL in Your Car!*

In-Dash Mobile AM/ FM/ Shortwave Cassette Receiver

SAVE $200.00

* **Frequency:** 530-1710kHz, 3.1-21.9MHz AM, 87.5-108MHz FM
* **Modes:** AM, FM, FM Stereo
* **Selectivity:** AM Wide/ Narrow
* **Tuning steps:** 1, 10kHz AM, 50kHz FM
* **Display:** Backlit LCD
* **Antenna:** Motorola jack
* **IF:** Double conversion superhet
* **Response:** 40-20,000Hz
* **Power requirements:** 13.6 VDC
* **Size:** 7"W x 2"H x 6"D ; wt. 8 lbs.

List $499.00 Super Summer Saver $299 +s&h

!!WARNING!!

FCC 1-93 Threatens Your Freedom.....to listen to any part of the RF spectrum you wish. A bill passed by Congress will stop the manufacturing and the importation of scanning receivers that cover or can easily be modified to cover the cellular phone band.

Now is the time to buy your full frequency coverage scanner.... after Oct. 24, 1993, it may be too late!!

YAESU FRG100 "Best Communications Receiver 1992"

AWARD WINNING!

We agreed with WRTVH...
This is the GREAT receiver!
Special price and *FREE* 1 year
EEB extended warranty ($59.95 Value)....

NOW only $549.95 +s&h

- 50kHz-30MHz
- Multimode (FM Option)
- Tuning steps: 10,100, 1000Hz
- Filters: 2.4, 4, 6kHz(Opt. CW .5kHz)
- 50 Memory channels
- Dual ant. inputs: 50 & 450 Ohm
- Power: 11-14VDC 1.2A max.
  AC Adaptor incl.

EEB FRG100 HP Filter Upgrade

We install on our own board, a Collins 6.0kHz AM and a new model 15 pole 4kHz ceramic filter. These 2 filters offer significant receiver upgrade, rectifying the only weak link the FRG100 exhibits.

FRG100 HP & 2 Filter Upgrade... $699.95 +s&h

Opt. CW 500 Hz Collins Filter.....$115.00

ICOM R72A

OVER 30% OFF

Hurry on this deal... A very special buy allows us to pass along these unbelievable savings. ICOM R72A list $1145 - OUR regular discount price $959.95.....but now our special is $769.95. That's **WAY BELOW** dealer cost.
!!HURRY!! There is a limited quantity at this price.

- 30kHz-30MHz
- Multimode (FM Option)
- Direct keyboard entry
- 101 Memory channels
- Power: 13.8VDC, 100, 120,240VAC
- Size: 9.5"W x 3.7"H x 9"D; WT: 10.6 lbs.

List $1129.00

WHILE THEY LAST $769.95 +s&h

KENWOOD R5000 Owners

SAVE 40%

The single, most effective way to improve the R5000 is to replace the AM wide filter with a high quality 8-pole crystal filter. This filter plugs in - no soldering or special tools! This is a special offer and limited to our stock, so DON'T WAIT!!

Compare: Kenwood YK88A-1 @ $94.95. EEB offers this same filter on our epoxie plug-in board and saves you 40%!!

Special Sale $57.00 +s&h

TOP SCANNING RECEIVERS

AOR-	AR1000XLT◊	$419.95
	AR3000A◊	$1029.95
	AR2800◊	$449.95*
REALISTIC-	PRO2006†	$359.95
	PRO43†	$299.95
	PRO46†	$189.95
BEARCAT-	BC200XLT†	$229.95*
	BC760XLT†	$249.95
	BC800XLT◊	$219.95*
	BC700A†	(call)
	BC2500XLT‡	(call)
	BC890XLT‡	$259.95
	BC8500XLT‡	(call)
ICOM-	ICR1◊	$479.95
	ICR100◊	$649.95
	ICR7000◊	$1279.00
	ICR7100◊	$1329.00

◊Covers cellular full coverage, no mods
†Easy mod instructs. for cellular
‡Cellular mod info not clear yet (call)
***NEW LOWER PRICE**

TOP SWL RECEIVERS

SONY-	ICF-SW33	$179.95
	ICF-SW55	$349.95*
	ICF-SW77	$469.95
	ICF-SW7600	$219.95
	ICF-2010	$349.95
PANASONIC-	RFB45	$169.95
	RFB65	$219.95
SANGEAN-	ATS606	$159.95
	ATS803A	$179.95
	ATS818	$199.95*
	ATS818-SC	$229.95*
ICOM-	R71A	$1059.00
	R72A	$769.95†
	R9000	$5199.00
DRAKE-	R8	$969.00
JCR-	NRD535	$1199.00*
	NRD-535D	$1699.95*
LOWE-	HF150	$599.95
	HF225	$749.95
GRUNDIG-	700	$449.95*

*** Temporary Price Reduction (SAVE)**
† Super Low Price Limited to Stock

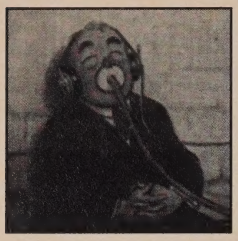
EEB
ELECTRONIC EQUPMENT BANK
323 MILL Street NE
Vienna, VA 22180

We accept VISA/MasterCard/American Express/Discover
We ship via UPS,Federal Express and Mail
ORDERS: 800-368-3270
Local Tech: 703-938-3350
FAX: 703-938-6911

*Sorry, no COD's
*Free Catalog in USA
*Prices Subject to change
*Prices do not include freight
*Returns subject to 20% restock fee

POPULAR COMMUNICATIONS

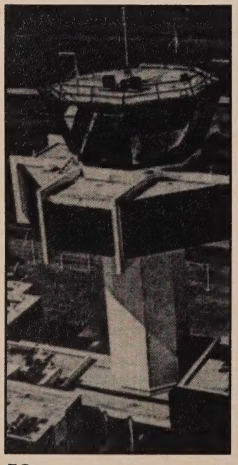
October 1993 **Volume 12, Number 2**



12

27

34



58

FEATURES

Scanning Armored Cars 8
Via your scanner, monitor the high-security vaults rolling through neighborhoods as they transport valuables. *By Chuck Robertson*

Now Hear This 10
Messages via M.A.R.S., linking service personnel to loved ones at home, date back to 1925 and are still being used in the 1990's. *By Jerry Cody*

Tune In On Yesterday 12
Visualize the events and stations that shaped radio, as it was originally. *By Alice Brannigan*

Scramble Ramble 16
Law enforcement communications security is a matter of life and death for agents. *By Jerry Cody*

Portable Satellite Telephone System Becomes A Star 22
The MAGNAphone MX-2020P is a shining star as it wows audiences in its film debut. *By Deena Marie Amato*

COLUMNS

Emergency 18
Broadcast DXing 27
Scanning VHF/UHF 32
Satellite View 34
You Should Know 38
RTTY 42
How I Got Started 49
Listening Post 50
Books You'll Like 54
Communications Confidential 58
Pirates Den 65
Telephone Enroute 66
Washington Pulse 68
Clandestine Communique 71
CB Scene 72

DEPARTMENTS

Beaming In 4
Mailbag 6
New Products 31
World Band Tuning Tips 40
Communications Shop 75

This month's cover: *An operator uses the MAGNAphone MX-2020P to place a phone call via Inmarsat satellite from remote areas of the world. Photo by Larry Mulvehill, WB2ZPI.*

EDITORIAL STAFF
Tom Kneitel, K2AES/KNY2AB, Editor
Deena Marie Amato, Associate Editor

CONTRIBUTING EDITORS
Gerry L. Dexter, Shortwave Broadcast
Robert Margolis, RTTY Monitoring
Gordon West, WB6NOA, Emergency
Don Schimmel, Utility Communications
Edward Teach, Alternative Radio
Harold A. Ort, Jr., Military consultant
Janice Lee, Radar Detectors
Chuck Gysi, N2DUP, Scanners
Roger Sterckx, AM/FM Broadcasts
Harry Helms, AA6FW, Thoughts and Ideas
Donald Dickerson, N9CUE, Satellites
Kirk Kleinschmidt, NTØZ, Amateur Radio
Joe Carr, K4IPV, Antennas

BUSINESS STAFF
Richard A. Ross, K2MGA, Publisher
Donald R. Allen, N9ALK, Advertising Mgr.
Emily Kreutz, Sales Assistant
Dorothy Kehrwieder, General Manager
Frank V. Fuzia, Controller
Catherine Ross, Circulation Director
Melissa Kehrwieder, Data Proc. Manager
Carol Licata, Data Processing
Denise Pyne, Customer Service

PRODUCTION STAFF
Elizabeth Ryan, Art Director
Barbara Terzo, Assistant Art Director
Susan Reale, Artist
Edmond Pesonen, Electronic Comp. Mgr.
Dorothy Kehrwieder, Production Manager
Emily Kreutz, Production
Pat Le Blanc, Phototypographer
Hal Keith, Technical Illustrator
Larry Mulvehill, WB2ZPI, Photographer

A publication of

CQ Communications
76 North Broadway
Hicksville, NY 11801-2953 USA

Offices: 76 North Broadway, Hicksville, NY 11801. Telephone (516) 681-2922. FAX (516) 681-2926. Popular Communications, Inc. Second class postage paid at Hicksville, NY and additional offices. Subscription prices: Domestic—one year $19.95, two years $38.00, three years $57.00. Canada/Mexico—one year $22.00, two years $42.00, three years $63.00. Foreign—one year $24.00, two years $46.00, three years $69.00. Foreign Air Mail—one years $77.00, two years $152.00, three years $228.00.

U.S. Government Agencies: Subscriptions to Popular Communications are available to agencies of the United States government, including military services, only on a cash with order basis. Requests for quotations, bids, contracts, etc. will be refused and will not be returned or processed.

Entire contents copyright © 1993 by CQ Communications, Inc. Popular Communications assumes no responsibility for unsolicited manuscripts, photographs, or drawings. Allow six weeks for change of address or delivery of first issue.

Printed in the United States of America.

Postmaster: Please send change of address to Popular Communications, 76 North Broadway, Hicksville, NY 11801.

MONITOR MORE WITH ADVANCED EQUIPMENT FROM UNIVERSAL!

COMMUNICATIONS RECEIVERS

● **Japan Radio NRD-535D**

The deluxe "D" version with BWC, ECSS and three filters included. ..... **$1699.00** (+$18)
NRD-535 standard version ... **$1199.00** (+$16)

● **Icom R-9000**
The ultimate "DC to daylight" receiver. With built in CRT. Write for details.....**$4999.00** (+$30)

● **Drake R-8**
A state-of-the-art receiver for the 90's. Five bandwidths, Syncro.,etc ..... **$959.95** (+$11)

● **Kenwood R-5000**
A powerful receiver for the serious DXer. An exceptional value. ..... **$899.95** (+$12)

● **Lowe HF-150** ***NEW! Made In England.***
Finally ... a true *portable* communications receiver. Write for brochure. ..... **$599.95** (+$7)

PORTABLE RECEIVERS

● **Panasonic RFB-45**

Keypad, 18 memories, scan and search functions, S.S.B., fine tuning knob, clock-timer, S-METER, etc. **$169.95** (+$5)

● **Sony ICF-SW77**
Sony's finest! 94 alpha memories, dual clocks, sync. detection. **$489.95** (+$6)

● **Sangean ATS-818CS**
Finally, a quality digital receiver with cassette, 45 mems., SSB. **$249.95** (+$7)

● **Grundig Satellit 700**
Hi-tech with beautiful fidelity and style. Synchronous tuning. **$479.95** (+$6)
Note: Radios listed above are all LW-MW-SW-FM digital. Contact us for other models.

COMMUNICATIONS BOOKS

● **Passport To Worldband Radio**
By L.Magne. Graphic presentation of all SWBC stations. Equipment reviews too. **$16.95**

● **Shortwave Receivers Past & Present**
By F.Osterman. Your guide to 200 receivers with new-used value, specs, features. **$8.95**

● **Aeronautical Communications Handbook**
By R.Evans. A mammoth book on all aspects of shortwave aero listening. 266 pages. ... **$19.95**

● **Complete SWL's Handbook**
By Bennett, Helms, Hardy. Nearly 300 pages on all aspects of SWL'ing. **$16.95**

● **Guide To Utility Stations**
By J.Klingenfuss. The definitive guide to utility stations- CW, SSB, FAX and RTTY. **$36.95**

● **Easy-Up Antennas for Listeners & Hams**
By E. Noll Low cost, easy to erect antennas for LW, MW, FM, SW, SCAN and HAM. **$16.95**

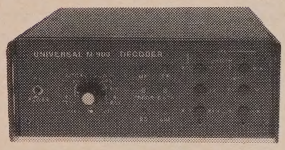
● **World Radio TV Handbook**
All SWBC stations by country with schedules, addresses, power, etc. Reviews too. ... **$19.95**

● **Discover DXing!**
By J. Zondlo. An excellent introduction to DXing the AM, FM and TV bands. **$4.95**

✓ Please add $1 per title for shipping.

MULTI-MODE CONVERTERS

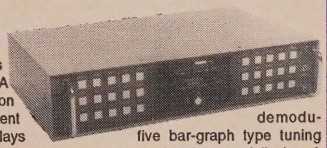
● **Universal M-900**



You can monitor:
- ✦ Coastal Station Tfc.
- ✦ Ship Telexes
- ✦ Press Reports
- ✦ Press Photos
- ✦ Satellite Photos
- ✦ Weather Maps
- ✦ Unclass. Military Tfc.
- ✦ Diplomatic Traffic
- ✦ Ham Messages
- ✦ Weather Reports
- ✦ Research Traffic
- ✦ Packet Messages
- ✦ Radio Bulletins

If you are only *listening* to your shortwave radio you are missing half the fun. With the addition of a Universal decoder and monitor you can *see* the world. The shortwave spectrum is filled with interesting text messages and photos that you can intercept and display. If this sounds interesting to you, request our two free pamphlets: *Listening to Radioteletype* and *Receiving FAX on Your Shortwave Radio.* Shown above is the Universal M-900 ($429.95) which decodes: Morse code, Baudot RTTY, Sitor A/B, FEC-A and FAX. Contact us today for information on the full line of Universal decoders.

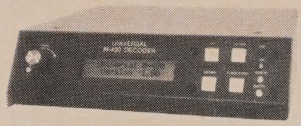
● **Universal M-8000**



The M-8000 offers tremendous intercept power to let you listen to the exciting world of radioteletype and FAX on shortwave, VHF and satellite! It includes capabilities not available in other decoders. The VGA color output permits the presentation of more information than ever before. A double status line indicates all current demodulator and decoder settings. The lower left corner displays five bar-graph type tuning bars. A horizontal window at the bottom of the screen shows a continuously updated, spectral display. A square window in the lower right corner features a simulated X-Y tuning scope. The M-8000 decodes all the "standard modes" plus ARQ-M2/4 (TDM), FEC-A, FEC-S, ARQ-E, ARQ-E3, ARQ-S, SWED-ARQ and Piccolo used by diplomatic, military and aeronautical concerns worldwide. The M-8000 itself is automated, utilizing a microprocessor to control shift tune and selection. Manual tuning is facilitated by on-screen bargraph tuning indicators for level, mark and space plus a simulated tuning scope. Instructive LEDs for: Mark, Space, Buffer, CW Lock, Squelch, Idle, Sync., Sel-Cal, Data, Tuning Error and Data Error. Other refinements include: ATC, UOS, built-in diagnostics, bit inversion (Baudot), speed readout, external scope output plus serial and parallel printer ports. Can be 19 inch rack mounted with optional mounting kit. 9 Lbs. (15 Lbs. ship). 115/230 VAC, 50/60 Hz. Requires a VGA analog color monitor. **$1299.00** (+$10)

DATA AND TONE READER

● **Universal M-400**



Forget the limitations you have come to expect from most "readers". The self-contained Universal M-400 is a sophisticated decoder *and* tone reader offering exceptional capabilities. The SWL can decode: Baudot, SITOR A&B, FEC-A, ASCII and SWED-ARQ. Weather FAX can also be decoded to the printer port. The VHF-UHF listener will be able to copy the ACARS VHF aviation teletype mode plus GOLAY and POCSAG digital pager modes. Off-the-air decoding of DTMF, CTCSS and DCS is also supported. Big two-line 24 character LCD. The M-400 can even be programmed to pass only the audio you want to hear based on CTCSS, DCS or DTMF codes of your choosing. The M-400 runs from 12 VDC or with supplied AC adapter. The American-made Universal M-400 is *the* affordable accessory for every shortwave or scanner enthusiast. Specification sheet available. **Only $399.95** (+$6).

★ HUGE FREE CATALOG ★

Universal offers a new communications catalog covering shortwave, amateur and scanner equipment. There are also antennas, books, parts and accessories. This informative **100 page** reference covers everything for the radio enthusiast. With prices, photos and full descriptions.

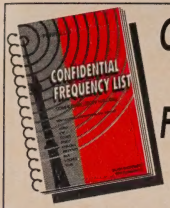
Available FREE by fourth class mail or $1.00 by first class mail.

- **Universal ships worldwide.**
- **Prices and specifications are subject to change.**
- **Universal in business since 1942.**
- **Visa, Master & Discover Card.**
- **Used equipment list available.**

universal radio inc.

Universal Radio, Inc.
6830 Americana Pkwy.
Reynoldsburg, Ohio
43068 U.S.A.

☎ 800 431-3939 Orders
☎ 614 866-4267 Information
➡ 614 866-2339 Facsimile



GILFER'S FAMOUS "CONFIDENTIAL FREQUENCY LIST" ONLY - $22.95

Popular Communications magazine says: "***Can't imagine anyone attempting to listen to HF voice or CW/RTTY communications without a handy copy.***" Most comprehensive list of SW utilities in the 1613 kHz – 30 MHz region. Over 30,000 frequencies with call sign, country, details covering across marine, embassy, weather, press, feeders, INTERPOL, time, channel markers, aero and more. Now includes voice, RTTY, CW and FAX modes as well as charts. Features spiral binding and reverse callsign list.

Add $4 in USA and Canada. $15.00 overseas.

GILFER SHORTWAVE 40 anniversary 1953 - 1993

GILFER SHORTWAVE

52 Park Ave., Park Ridge, NJ 07656

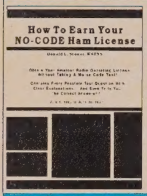
(close to GS Parkway, NY Thruway, Rt. 80 and Rt. 287. Phone for directions and hours.)

201-391-7887

SEND $1 FOR FIRST CLASS CATALOG

CIRCLE 65 ON READER SERVICE CARD

How To Earn Your NO-CODE License



Don Stoner, W6TNS, has done it again with the only guaranteed study material. If you fail your test, NARA will refund your money—no questions asked! The first edition was critically acclaimed—now Don has updated it for the July, 1993/ June, 1997 period. **YOU CAN DO IT!**

We Guarantee it!!!

How To Earn Your No-Code Ham License is not a memorization book and it isn't loaded with material you won't be asked on your test. "Twin Noise Squelch" explains the theory behind the questions in a simple, easy-to-understand style. The actual questions that will be asked are included at the end of each chapter so you can *test yourself immediately.* Numerous photos and drawings make the information easy to absorb. Great for Novice testing too! ***How To Earn Your No-Code Ham License*** is an ideal classroom textbook and is supported by testing software for the IBM and Macintosh and an instructors guide, with view foils, for teachers. In stock at all major Amateur Radio dealers or call NARA toll-free for same day shipping. Now only $9.95 ($2.00 S&H)

NARA
NATIONAL AMATEUR RADIO ASSOCIATION

MasterCard VISA

Box 201407, Arlington, TX 76006

1-800-GOT-2-HAM

CIRCLE 75 ON READER SERVICE CARD

BEAMING IN

BY TOM KNEITEL, K2AES

AN EDITORIAL

You Be The Judge

It would seem that there are certain basics about a person's rights to being fairly judged in this country. A citizen is given to believe that they are presumed to be innocent until they are charged with breaking a law, then brought into a court of law and can proven to be guilty. There are courtroom procedures, rules of evidence, legal precedents and many other factors that bear upon proving someone to be guilty. As citizens, the Fourteenth Amendment assures us all the right to this due legal process before we may be deprived of life, liberty, or property. We learned about it in school. Even people who slept through Social Studies, couldn't miss it on *People's Court* and *L.A. Law.*

In the layman's mythology we all know it to be true because it's on TV, if a person is charged with a violation of a law, they are summoned to a court of law. An attorney representing the people presents a case, along with all evidence and the testimony of witnesses, in an effort to prove the defendant guilty. The defendant is permitted to face his or her accusers. Subsequently, the defendant's attorney mounts a defense consisting of an alibi, evidence, witnesses, and possibly testimony from the defendant in the hope that these things will refute the charges and prove the defendant to have been wrongly accused. After that, a jury (or sometimes the judge) will weigh the evidence and then render a verdict of guilty or not guilty.

In a small claims court or instances of those traffic law violations where the worst possible damage would be a relatively small amount, the proceedings are usually somewhat informal. Still, the presumption of innocence until guilt which is proven before a judge, remains intact.

Therefore, I have always had a difficult time trying to buy the premise of the way they come to get someone with the hook at the FCC. Let's say that a station or individual is claimed to have done something that an FCC employee doesn't think is in line with FCC regulations.

There are lots of things they don't like at the FCC, and depending upon the radio service, they don't miss a trick. Besides the definite ones like not lighting a broadcast tower or running too much power, there are some that are fuzzy. This includes areas touching upon obscenity.

Next, consider that although you are required to follow the FCC operating requirements to a tee, most of the FCC commandments are regulations, not laws. Though many people consider them all to be laws, this is giving them more status than regulations deserve. There are differences between a law and a departmental regulation.

For practical purposes, there would really be no harm for people to think of the regulations as laws. Unfortunately, when the agency perceives that one of its regulations has been violated, the Constitutional guarantees of Fourteenth Amendment vaporize. The Fourteenth Amendment assures citizens that the government can't came along and enforce any law that abridges the privileges of citizens. Well, who said the all the FCC regulations are laws?

The agency immediately pronounces the licensee "apparently" guilty, and then sends a "Notice of Apparent Liability" (NAL) demanding payment of a monetary forfeiture (read that "a fine"). That means the presumed-guilty licensee must either prove innocence, plead guilty with an explanation and beg for a reduced amount, or or else cough up the entire fine.

Attempting to prove one's innocence after having been deemed "apparently" guilty by the FCC right from the outset is bad enough. It gets worse. There is a "hearing board" made up of a panel of FCC employees. This is hardly a jury of one's peers, or impartial citizens. The officiating honcho is called an "Administrative Law Judge." Don't be too impressed by the use of the title "judge" here. This is not a judge in the sense that this is a black-robed person appointed or elected to the bench in a court of law. This "judge" is not necessarily an attorney.

This "judge" is an FCC employee the agency has assigned this job within the agency's own private internal justice system. This person is no more a court system judge than you or I. Although the end result may seem the same as a courtroom trial, these events aren't called trials, they are "hearings." Courtroom rules of evidence do not apply.

Barry A. Stevenson was sent an NAL by the FCC because the agency claimed that there were complaints filed against him, confirmed by their own investigation, that he had operated an unlicensed radio sta-

(Continued on page 74)

For superior performance most advanced technology and greatest sensitivity

OPTOELECTRONICS

Model M1 & 3000A

Hottest on the Market with:

Digital Filtering for the fastest method to reduce false counts–no loss of sensitivity &

Digital Auto Capture that auto holds and stores–working even near strong RF fields!

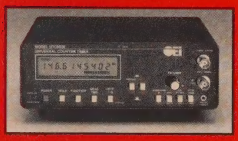
Antennas not included

- **3000A-Multifunction HandiCounter**
  - 15 Gate times selectable • 7 hrs. Battery life
- **M1-Full Range HandiCounter**
  - 10 Gate times • 6 hrs. Battery life

Both offer:

- OE10–Ultra Fast & Reliable Counter IC
- Standard Backlit 10 digit LCD Display
- 16 Segment Signal Strength Bargraph
- 3 Data Storage Registers
- 1.3% of a second Measurement Rate
- 1Hz Resolution in 1 Sec. up to 250MHz
- 2 Wire Serial Output for Data Logging

M1 $229.
3000A $329.



Model 8030

Bench/Portable Multifunction Counter

10Hz - 3GHz, extremely High Sensitivity, High Resolution and Accuracy, includes Bargraph, ± 1ppm TCXO, Two Inputs, Trigger Variable and Hold Button

$579.
Premium TXCO $135.
BLB Backlight Beeper $ 75.

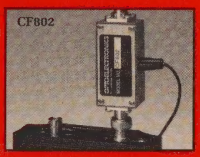
DYNAMIC DUO FM Intercept, Detect, Decode Tones...CTCSS, DTMF and DCS

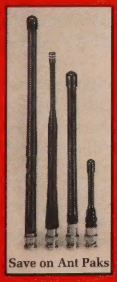
The R10 is a unique FM Communication Test Receiver with security and surveillance applications. The R10's full spectrum audio output interfaces directly with the DC440 to monitor CTCSS and DTMF, FM Deviation and Relative Signal Strength.

Optoelectronics Advantages

1. Decode & Display CTCSS, DTMF or DCS & DTMF simultaneously
2. 127 Character DTMF Buffer with scrollable 10 Character Display. No Lost Data
3. LCD Display, visible in bright Sunlight
4. Serial Computer Interface
5. *Activity indicator*—lets operator see when unit is actively decoding
6. High Quality NiCad Battery pack option
7. Actual DTMF Characters Displayed!

R10 $359.
DC440 $259.
Save! Buy Both! PACKAGE $549.





Model APS104

Tunable band pass filter system Covers 10MHz to 1000MHz. Tunes continuously over more than 5 octaves and maintains a constant 4MHz band width.

Use with counter or R10 Interceptor to increase pick-up distance up to 10 times. Ultimate Security Sweeper. **$995.**

The Model CF802

835MHz ± 10MHz filter/amplifier for use with near field instruments such as the Model R10 Interceptor and Models 3000A and M1 HandiCounters® to extend the pick up distance by limiting the band width and adding amplification. The pick-up distance when using the CF802 with the Model 3000A or M1 will improve from 25 feet to over 200 feet. When used with a Model R10, the improvement will be from 75 feet to over 750 feet. **$149.**

TC200 Tone Counter

The most economical way to get CTCSS (Squelch Tone) measurement capacity. Actually measures the tone frequency! It is not limited to standard tones but has 5Hz to 300Hz continuous range with .1Hz resolution. The TC200 is fast with .2 second display update. A five pole switched capacitor filter ensures reliable counting even with voice present. **$179.**

Model SSB220

Directly measures the frequency of single sideband transmitters! The ideal instrument for precise net frequency control and a must for non-synthesized transceivers.

- Accuracy is 1x10 -6, Optional 1 c 10 -7
- Range: HF: .5 - 30MHz
  VHF: 10MHz - 3GHz
- HF antenna, VHF antenna Inputs
- Radio Audio/PTT, Serial data (I/O) Outputs

$279.

Save on Antenna Packages

Ant Pak I: TA100, RD27, RD800.....$65.00

Ant Pak II: RD27, RD50, RD100, RD440, & RD800.....$99.00

ORDER LINE

1-800-327-5912

305-771-2050 • FAX 305-771-2052

5821 NE 14th Ave, Ft. Laud., FL 33334
5% Ship/Handling (Min $5 & Max $10) U.S. & Canada. 15% outside continental U.S.
Visa, Master Card, C.O.D., Cash or Money Order only.

NOW YOU'RE TALKING!

The Code-Free Ham License is Here

Enjoy all Amateur Radio privileges above 30 MHz without having to pass a code test. All you have to do is pass a 55-question exam on basic radio and the FCC regulations. ARRL's new book, **Now You're Talking** makes understanding what is required on the test a snap! And there are exams given all over the country every weekend.

Just think how much fun you'll have communicating through repeaters, enjoy Sporadic E skip and worldwide communications on six meters when conditions are right. There's satellite communication and you can even talk to Astronauts and Cosmonauts in orbit. Enjoy friendly local communication both direct and through repeaters. Help with disaster drills and the real thing! Sound like fun? It is! Order your copy of **Now You're Talking** below: Enclosed is $19 plus $4 for shipping (a total of $23) or charge $23 to my ( ) VISA ( ) Mastercard ( ) Discover ( ) American Express

For More Information Call 1-800-326-3942

Signature_____

Acct. No._____

Good from_____ Expires_____

Name_____

Address_____

_____

_____

City State Zip PC

THE AMERICAN RADIO RELAY LEAGUE
225 MAIN STREET
NEWINGTON, CT 06111

CIRCLE 52 ON READER SERVICE CARD

MAILBAG

LETTERS TO THE EDITOR

Each month we select representative reader letters for our Mailbag column. We reserve the right to condense lengthy letters for space reasons. All letters submitted must be signed and show a return address. Upon request, we will withhold sender's name should the letter be used in Mailbag. Address letters to Tom Kneitel, Editor, Popular Communications Magazine, 76 N. Broadway, Hicksville NY 11801.

Support Public TV Stations, What?

Your witty comments in the July editorial concerning TV station fund-raising techniques were enjoyed. I can assure you that if anybody at PBS wears sackcloth, it is sackcloth with a designer label.

George Zimmerlee, N4XDC
Marietta, Georgia

Changing The Name of Amateur Radio

With reference to your June editorial, suggesting that the term "Amateur Radio" be discontinued and replaced by a more updated one, I would like to offer several thoughts. First, based upon the operating skills I have witnessed coming from many no-code licensees, I feel the word "amateur" is becoming more appropriate, not less. Second, if the service absolutely must have a new name, how about: "The Bright New People Who Are Too Damn Lazy To Put Out The Minimal Effort To Learn The Code Radio Service"?

Ken R. Noffsinger, AE8I
Tipp City, Ohio

Thank you for raising the question regarding whether the term "amateur radio" has now become more of a liability than an asset. Given the meaning most people today assign to this word, the answer is "yes." In Microsoft Works Version 2, the following synonyms are listed for amateur: "nonprofessional, beginner, unskilled, inexperienced, incompetent, amateurish, bungled, unfit." Clearly, the current understanding of the word makes it inappropriate to describe our radio service. Moreover, at those times when policy makers are pressed for decisions about reallocating frequencies, this inaccurate descriptive label becomes an obvious liability. Think about how the names of other radio services describe or imply the production of some social or economic service or product: petroleum, forest products, police, fire, manufacturer's, land transportation, highway maintenance, auto emergency, business, railroad, broadcasting, etc. The word amateur does not describe any social or economic service or product, and it even has a definitely negative connotation.

Other radio services compete with us for spectrum space, and they are always looking for more space. It is obviously a mistake to continue allowing our radio service to carry this worn-out label. We now need a terminology that indicates that our service is not-for-profit, public-domain, domestic-international, and research-developmental in nature. Sure, we can still call ourselves hams, and we can tell one another we are amateurs, but we need to go on the FCC books with something better.

In our hearts, we would always know that amateur radio operators are part of a proud tradition, and that when the word was originally applied to our radio service it was because it was derived from the Latin *amor,* to love, because we loved the beauty of the craft, science, and artistry of radio. But that was long ago. We don't love it any the less now, but we do need to get our official name changed just to stay viable.

Theodore Walker, Jr., WB4MFI
Dallas, Texas

Language Changes

I support you in the July editorial relating to dreadful and degrading changes in the use of language, for example the use of "go" substituted for "said." Perhaps the irritants you outlined are only secondary to the fact that AM broadcasting has also degraded to the point where it is also not worth listening to.

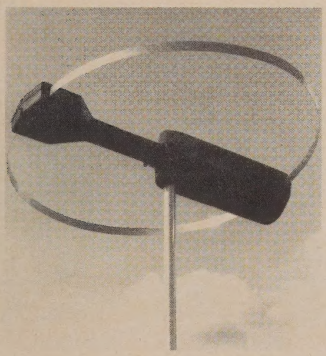
No longer is AM the rich source of riveting stories to stretch the imagination, nor the place to look for other imaginative programming (except for live sports). It has become the place for cheap programming that allows the station to survive in this area of stiff competition from other media. Unless you're interested in syndicated talk shows conducted by people who think they're going to succeed Father Coughlin as the radio leaders of the nation, don't bother!

Your editorial mentioned using a Diskman. My choice is an old RTR tape recorder with tapes of broadcasts from the days when AM radio was something of value. I can even listen in my car.

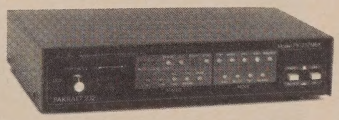
David N. Klein
Danvers, Mass

STEP UP YOUR SHORTWAVE SET UP.

ISOLOOP 10-30 HF PORTABLE ANTENNA.
This is the one that gives you freedom of speech, whether you have to deal with restrictive covenants at home or in your apartment or condo, or if you are traveling in your boat, car, or RV. It features 150 watts, continuous coverage from 10 to 30 MHz, narrow bandwidth to suppress out-of-band signals. The IsoLoop antenna comes fully assembled with no mechanical joints. There is simply no better value in antennas!



PK-232MBX DIGITAL MULTI-MODE CONTROLLER.
It can receive eight different types of data signals, including Morse code, Baudot, ASCII, Time Division Multiplex (TDM), WEFAX, NAVTEX, Packet and AMTOR. Also featured is SIAM which automatically identifies many types of digital signals, excellent software support for PC compatibles, Macintosh and Commodore 64 & 128 computers. This unit is essential for the serious digital listener.



AEA-FAX.
Here's the superior way to decode multi-level gray fax images received by your general coverage receiver. Featured is AEA's exclusive on-screen tuning scope that allows you to simultaneously tune and receive. There is also Autolist for unattended image capture and save-to-disk, "daisy-chain" external RS-232 input allowing AEA-FAX to share a COM port with PK-232 MBX, up to 16 gray levels (VGA), support for EGA, CGA and Hercules formats. AEA-FAX prints to HP LaserJet or Epson compatible printers and includes hardware demodulator, 3 1/2" and 5 1/4" software disks plus a comprehensive instruction manual. AEA-FAX is a must for your set-up!

To connect with the AEA dealer nearest you or for product sheets, call (800) 432-8873.

Advanced Electronic Applications, Inc.
PO Box C2160, 2006 - 196th St. SW, Lynnwood, WA 98036 Sales: (206) 774-5554

Connect with us

Scanning Armored Cars

Don't Overlook The Possiblities of Monitoring the Rolling Vaults

BY CHUCK ROBERTSON

Cash needs to move between banks and stores, and it goes to check cashing services, factories, offices, and many other types of businesses. Also, jewelry requires transportation, as does precious metal ingots, art treasures, and other valuable items. For as long as valuables of any kind have been transported, there have been those who have conspired to steal that property. Through the centuries these people have been categorized as pirates, stagecoach robbers, and train robbers. These days, they are most interested in armed cars and trucks. The stakes are high, and these thieves are often both resourceful as well as violent.

Armored vehicles provide an important service by transporting valuables. The companies providing this service have gone to considerable lengths to ensure that they do this safely and efficiently. But it isn't easy, and every trip is potentially a dangerous trip since millions of dollars may be rolling down Main Street.

Communications are a vital part of these activities. If you have a scanner, you can monitor this armor-plated action!

High security comms keep on rolling via armored trucks.

Ridin' Shotgun

An armored vehicle is a small rolling fortress. There are trained and armed personnel inside the truck that has been constructed with walls, tires, and windows that are bulletproof. Slots are provided throughout the body of the truck so those on the inside may use firearms to defend the property they are transporting.

Special ventilation systems are impervious to attacks by gas. In the event the driver should be overpowered by robbers, a switch can be activated that will shut down the vehicle's ignition so that it can't be started again.

Some of the bags used to transfer money are dummy sacks containing alarms, homing transmitters, exploding dye bombs, or other similar surprises.

Every move the armored car makes is carefully planned, although schedules are rotated to avoid easily determined patterns. Sometimes the vehicles are dispatched over the air, or last minute pick-up stops are given by radio. Vehicles must communicate with their dispatcher to

Some items being transported have little intrinsic value. This includes business data, cancelled checks, blood plasma, or radioactive isotopes.

Armored Vehicle Services Sampler

Armored Car Co., Louisville, KY: 159.495; Springfield, IL: 461.925; W. Orange, NJ: 463.875
Armored Car of York, PA: 462.80
Armored Motor Service of America, Woodlawn, NY: 457.725 461.80; Grand Island, NY: 464.65; Pompey, NY: 463.375
Armored Protective Svc., High Point, NC: 462.05
Armored Svc., Mishawaka, IN: 464.075
Armored Transport, (many locations) CA: 853.6125; El Toro, CA: 452.775; Lucerne, CA: 463.50; Palm Desert, CA: 159.93; Sacramento, CA: 851.4375; Yermo, CA: 464.15; Camas, WA: 464.05
Berkshire Armored Car W. Springfield, MA/Colchester, VT: 159.555
Brinks: wide use: 159.495 467.0125 467.8125; CA 44.20; Wichita, KS: 461.425; MO: 467.7625; Chatsworth, NJ: 461.075; Hopewell Twp, NJ: 461.10: Milway, NJ: 461.25; Brooklyn, NY: 461.6375; OH: 44.44; PR: 464.125; San Antonio, TX: 44.20; Richmond, VA: 461.40; Bremerton, WA: 463.275; Wheeling, WV: 461.275
Brooks Armored Cars, NJ & PA: 159.81
City Armored Service, San Antonio, TX: 154.515
Fargo Overland Protective Svc., Oneonta, NY: 464.725
Hudson Armored Car, Hartsdale, NY: 462.725
Jewelers Protection, New York, NY: 466.0125 928.0875
Loomis Armored Cars, Anchorage, AK: 159.63; Wasilla, AK: 462.05; Tuscaloosa, AL: 463.575; Bisbee, AZ: 461.025; Tucson, AZ: 461.025 461.80; Yuma, AZ: 44.22; Los Angeles, CA: 508.6375; Denver, CO: 159.81; Glastonbury, CT: 159.75; FL: 43.92; Atlanta, GA 461.55; Chicago, IL: 463.50; Indianapolis, IN: 463.575; Mooringsport, AL: 461.125; New Orleans, LA: 159.99; Baltimore, MD: 150.14; Southfield, MI: 463.45; Holly, MI: 463.275; Minneapolis, MN: 463.575; Jackson, MS: 464.025; Pennsauken, NJ: 501.9625; Las Vegas, NV: 461.975; New York, NY: 463.875; OK: 159.69; Portland, OR: 461.975; Memphis, TN: 159.89 159.945; TX 159.84 466.0375; Corpus Christi, TX: 464.75; El Paso, tx: 464.45; Moody, TX: 463.475; Tyler, TX: 461.625; Bremerton, WA: 462.05; De Pere, WI: 464.25; Scrays Hill, WI: 461.30; all areas: 43.96 154.57 154.60
Midwest Armored Express, Omaha, NE: 464.625
Purolator Courier, USA: 154.57; Los Angeles, CA: 464.425 464.675 475.3625; Los Gatos, CA: 160.20; Baltimore, MD: 452.375; Glenola, NC: 463.725; Cedar Hill, TX: 452.675 452.70
Sectran Armored Transport, Pico Rivera, CA: 464.50 469.50
Secured Armored & Courier Svc., Medford, OR: 151.775
Security Armored Cars, Honolulu, HI: 159.93 160.20; St. Louis, MO: 461.925
Security Armored Express, MT: 159.66 461.4375 466.4375; Helena, MT: 451.50; Missoula, MT: 462.075
Security Couriers, Gary, IN: 461.05
Wells Fargo Armored Transport, USA: 159.855 160.11; Mobile, AL; 463.625; Little Rock, AR 463.075; Phoenix, AZ: 461.55; Tucson, AZ: 461.825; Colorado Springs, CO: 463.65 464.25; FL: 154.57; Jacksonville, FL: 159.78 464.30; Magnolia Park, FL: 159.60; Orlando, FL; 462.65 461.475; Atlanta, GA: 452.70; Savannah, GA: 463.30; IL: 468.2125; Baton Rouge, LA: 461.75; Churchpoint, LA: 463.275; New Orleans, LA: 452.65; Boston, MA: 452.80; Pelham, MA: 464.80; Taunton, MA: 159.63; MD: 461.7625; Billings, MT: 463.95; Charlotte, NC: 160.08; Omaha, NE: 461.375; NJ: 465.8875; Albuquerque, NM: 462.175; Cleveland, OH: 463.95; Youngstown, OH: 464.60; PR: 150.905 159.69; Columbia, SC: 463.625; Oliver Springs, TN: 463.675; Nashville, TN: 464.25: El Paso, TX: 464.85; Salt Lake City, UT: 463.85; Arlington, VA: 464.65; Roanoke, VA: 452.85; Virginia Beach, VA: 464.45; St. Croix, VI 150.905 157.65

report arrival/departure from pickup/delivery stops. The driver also reports breakdowns, detours, delays, traffic jams, unusual circumstances, or suspicious vehicles.

In the event of a mechanical breakdown, the police are called to the scene until the vehicle can resume its route. If it can't be quickly repaired, its contents are transferred to another armored vehicle.

Armored services usually turn up in the trucking and business radio service bands.

Inside Stuff

About half of the robberies of armored car services are inside jobs involving one or more former and/or present employees of the company. It's ironic, but nobody knows more about a company's security measures, work shifts, personnel assignments, customers, and times when large amounts of cash are most likely to be collected.

A few months ago, the Revere Armored, Inc., of New York, the nation's tenth largest armored car company, abruptly shut down. The married couple who owned the company had vanished. It has been alleged that the owners embezzled $45-million from the company. Employees suddenly found themselves unemployed, and holding salary checks that bounced. Banks, jewelers, and others whose property Revere was holding wanted to know the status of their assets, however it had been impounded.

Company records were a mess, but seemed to indicate that funds held for several different customers had been casually intermingled and then distributed around to customers as required. Millions of dollars in cash was found lying about in desk draws, paper bags, and even in unmarked packages.

The owners of Revere Armored are now facing charges.

Regulations and standards in this industry are spotty. Some states have very stringent operating and licensing requirements for armored car services and personnel, others (New York State, for instance) have none whatsoever.

The public knows very little about armored vehicle operations. We could find no books about the industry. The industry is not anxious for the public to know much about its activities or procedures.

Your scanner could probably provide you with more information than available anywhere else. ■

Now Hear This

Mission To M.A.R.S

BY JERRY CODY

"We're keeping a candle lit in the window" and "Love go with you always" were radio messages to the United States Air Force and other Armed Forces people that contributed greatly to the success in liberating Kuwait in late February 1991. Throughout the war in the Persian Gulf, United States Air Force Military Affiliate Radio System or M.A.R.S. people linked service personnel with their loved ones at home. The reaffirming of family ties helped to keep the spirit of U.S. Armed Forces people going in the wait to battle Iraqi forces that started in the Summer 1990. The U.S.A.F. Military Affiliate Radio system or M.A.R.S. was there when "Desert Shield" became "Desert Storm" on January 16, 1991.

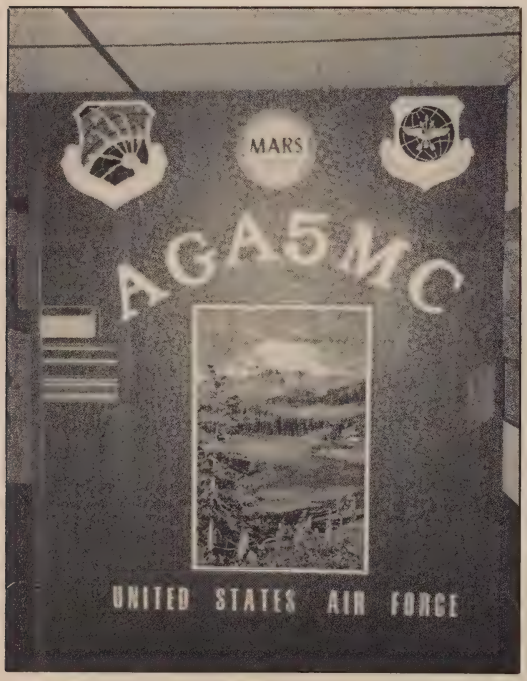
M.A.R.S. originated in 1925, and was known as the Army Amateur Radio System. Prior to World War II, civilian amateur members were given intense instruction from United States Army technical people on military radio operations. Shortly before the attack on Pearl Harbor, approximately 8,000 amateur radio operators had been trained.

When Congress declared war on Japan in 1941, The Federal Communications Commission terminated all amateur radio operations in the United States for national security reasons. In 1948, military planners decided radio amateur enthusiasts were too valuable not to have on call in the event of a national emergency. When the Army Air Corp became the United States Air Force on September 18, 1947, the Military Amateur Radio System was born.

In 1952, the mission of M.A.R.S. grew. The Military Amateur Radio System would now handle official United States Air Force radio traffic when regular systems were down. Messages from the American Red Cross were now routed through M.A.R.S. systems. Emergency Communications in Civil Defense were also assisted. It was decided the word "Amateur" was no longer appropriate in the M.A.R.S. acronym, and was replaced by "Affiliate."

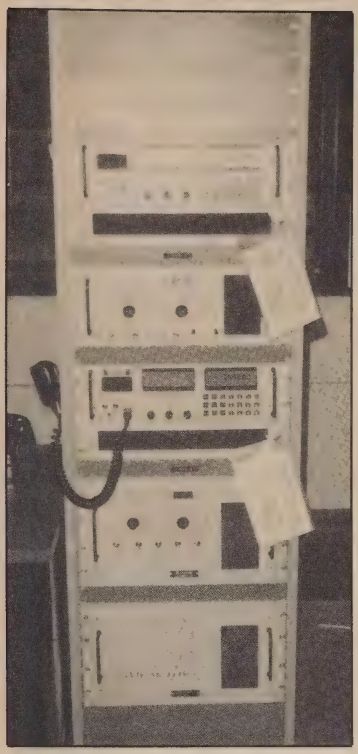
In 1959, M.A.R.S. units were given the task of providing back up to United States Air Force numbered units stateside. Transportable communications equipment was acquired to provide mobility, and in 1961, the U.S.A.F. Communications Command assumed management of the Military Affiliate Radio System.

Early during the Vietnam War, commercial telephone service was extremely limited.



Lobby of United States Air Force M.A.R.S. station at McChord, Washington. McChord Air Force Base is located approximately 30 miles South of Seattle, Washington and is home for the 62nd Military Airlift Wing.

High frequency radio tower.



High Frequency transceiving equipment for regional and transcontinental radio communication.

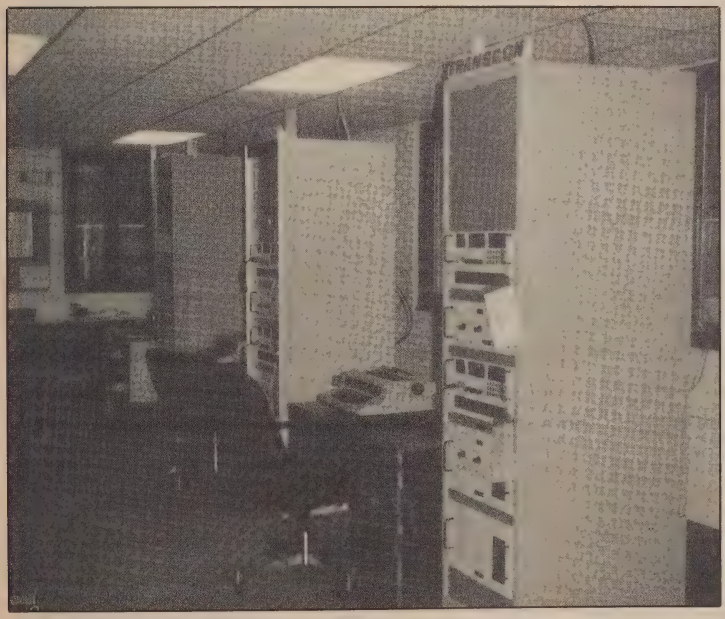
M.A.R.S. Frequency Ranges

3500kHz to	4100kHz
7300kHz to	7700kHz
10,000kHz to	10,300kHz
13,900kHz to	14,500kHz
15,500kHz to	15,800kHz
20,000kHz to	22,000kHz

In 1965, facilities could handle a maximum of 30 outgoing calls a day. With the holidays approaching, the military commanders in Vietnam had quite a predicament. Fortunately, the U.S.A.F. Chief of M.A.R.S. had portable equipment available and by December 14, began processing the 15,000 messages handled during that holiday season.

Today, the United States Air Force operates M.A.R.S. high frequency single sideband networks that stretch from the United States to Panama, the Pacific, Europe, and the Middle East. Frequencies in the 3, 4, and 7 MHz range are used regionally by M.A.R.S. Frequencies in the 10, 13, and 20 MHz range are used by gateway stations to feed overseas telephone calls into the United States. U.S.A.F. Military Affiliate Radio Stations have an operating schedule of 7 A.M. to midnight seven days a week.

Low morale can contribute greatly to a high casualty rate in combat. There is no greater satisfaction to a M.A.R.S. operator than knowing a serviceperson in a war zone had their spirit boosted from a phone patch back home in the United States. Great credit should be given to people involved with the United States Air Force Military Affiliate Radio System. ■



Transcontinental high frequency transceivers of M.A.R.S. station AGA5MC.

MFJ
SHORTWAVE ACCESSORIES

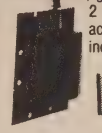
REMOTE ACTIVE ANTENNA

MFJ-1024 **$129.95** **Receive** strong clear signals from all over-the-world with this 54 inch active antenna that rivals long wires hundreds of feet long.

"World Radio TV Handbook" rates the MFJ-1024 as "a first rate easy-to-operate active antenna ... Quiet with excellent dynamic range and good gain ... Very low noise factor ... Broad frequency coverage ... the MFJ-1024 is an excellent choice in an active antenna."

Remote unit mounts outdoors away from electrical noise for maximum signal and minimum noise pickup. Mount it anywhere - atop houses, apartments, ships, buildings, balconies.

Covers 50 KHz to 30 MHz. High dynamic range eliminates intermodulation. Control unit has 20 dB attenuator, gain control. Lets you switch 2 receivers and auxiliary or active antenna. 'On' LED. 6x2x5 inches. Remote has 50 ft. coax and connector. 3x2x4 in. 12 VDC or 110 VAC with MFJ-1312, **$12.95**



INDOOR ACTIVE ANTENNA

MFJ-1020A **$79.95** **Now** you'll rival or exceed the reception of outside long wires with this **tuned** indoor active antenna. **'World Radio TV Handbook'** says MFJ-1020 is a "fine value ... fair price ... best offering to date ... **performs very well indeed."**

Its unique tuned circuitry minimizes intermod, improves selectivity, reduces noise outside tuned band. Functions as a preselector with external antenna. 0.3-30 MHz. Telescoping antenna. Controls are Tune, Band, Gain, On-Off/Bypass. 6x2x6 in. Use 9 Volt battery 9-18 VDC or 110 VAC with MFJ-1312, **$12.95**

ANTENNA TUNER/PREAMP

MFJ-959B **$89.95** **Don't** miss rare DX because of signal power loss between your antenna and receiver.

The MFJ-959B provides proper impedance matching so you transfer maximum signal from your antenna to your receiver from 1.6 to 30 MHz. You'll be surprised by significant increases in signal strength.

20 dB preamp with gain control boosts weak stations. 20 dB attenuator prevents overload. Select from 2 antennas, 2 receivers. 9x2x6 inches. Use 9-18 VDC or 110 VAC with optional AC adapter, MFJ-1312, **$12.95**

For your nearest dealer or to order:

800-647-1800

Order from MFJ and try it. If not satisfied return within 30 days for refund (less s/h). Add $5.00 s/h. One year **unconditional** guarantee. **Free catalog.**

MFJ ENTERPRISES, INC.

Box 494, Miss. State, MS 39762
601-323-5869 **Telex:** 53-4590 MFJSTKV

MFJ . . . making quality affordable

CIRCLE 70 ON READER SERVICE CARD

Tune In On Yesterday

A Look at Events & Stations That Shaped Radio

BY ALICE BRANNIGAN

Did you know that this year is the 50th anniversary of Motorola's development of the first practical application of FM two-way portable radio technology? This came about during World War II when the U.S. Army Signal Corps requested Motorola to come up with a two-way portable that had better range than the AM radio the U.S. Army called the SCR-536.

While the AM two-way portable radios had been a big step beyond hard-wired battlefield comms systems, they operated on a single channel, making them easy for the enemy to monitor. In addition, the battery life of the SCR-536 was short and the batteries couldn't be recharged.

The SCR-536 weighed only 5 lbs., but it had a range of only one to three miles. The U.S. Army initially ordered 3,500 of them, and just prior to the attack on Pearl Harbor in December of 1941, some 50 sets per day were being turned out. By the end of WWII, more than 130,000 would be built. The SCR-536 (which Motorola designed and built) was the first commercially produced two-way portable, or Handie Talkie.

Motorola's response for a more advanced radio became the Army's SCR-300 FM walkie-talkie backpack radio.

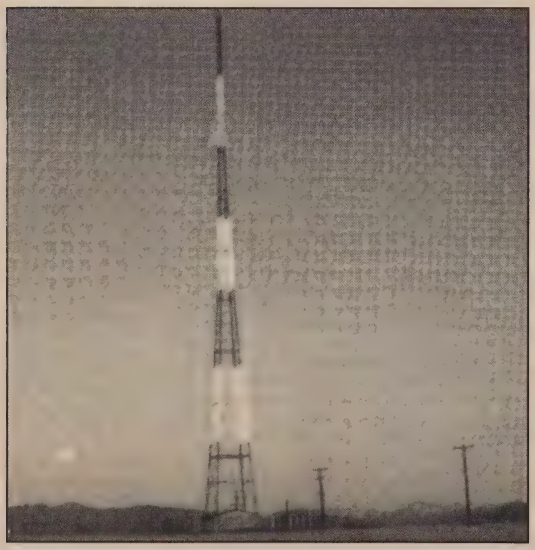
The SCR-300, introduced in 1943, weighed 35 lbs., and had rechargeable batteries. It was tunable and could operate on any frequency between 40 and 48 MHz. The set had a range of 10 to 40 miles, depending upon the terrain.

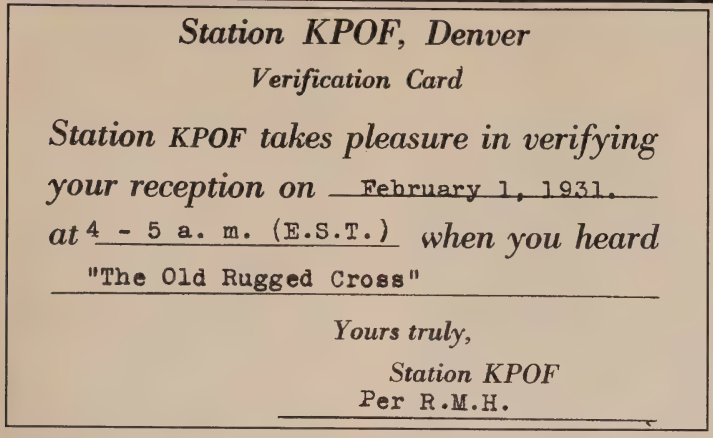
One of the first places it saw combat action was during the Allies' D-Day invasion at Normandy. The SCR-300 also hit the beaches under enemy fire at Anzio, Guadalcanal, and Iwo Jima.

Motorola produced more than 45,000 of these sets during the war, and they became the foundation for Motorola's postwar designs in portable FM two-way radios. The company's first commercially available FM two-way portable after the war appeared in 1947. Motorola called it a *Han-*

The old KPOF tower is a crumpled mass of twisted steel after being taken down. Years of exposure to the elements had weakened it to the point where the tower had become unsafe. (Photo by Patrick Griffith, Colorado.)

KPOF, Denver, had used this tower since the 1930's. It was retired from broadcast use in the 1970's, then served as a platform for two-way antennas. Now it has been taken down. (Photo by Patrick Griffith, Colorado.)





Station KPOF, Denver

Verification Card

Station KPOF takes pleasure in verifying your reception on February 1, 1931. *at* 4 - 5 a. m. (E.S.T.) *when you heard*

"The Old Rugged Cross"

Yours truly,

Station KPOF

Per R.M.H.

Denver's KPOF, owned by the Pillar of Fire Church, sent out this QSL card back in 1931.

die Talkie (a Motorola trademark, by the way) describing it as smaller than a briefcase. The transceiver weighed between 8 and 22 lbs., and put out 250 milliwatts. This was before before the invention of the transistor, so the unit used miniature tubes.

Motorola's first all-transistor *Handie Talkie* pocket receiver was introduced in 1958, with its companion transmitter coming out in 1959. The first all-transistor Motorola hand-held portable two-way radio was the HT200 that was introduced in 1962. It weighed only 33 ounces.

Technology had come a long way in the 19 years between the introduction of the 35-lb. SCR-300 and its direct descendant, the Motorola HT200 *Handie Talkie*. Happy 50th birthday, SCR-300!

Salem's First

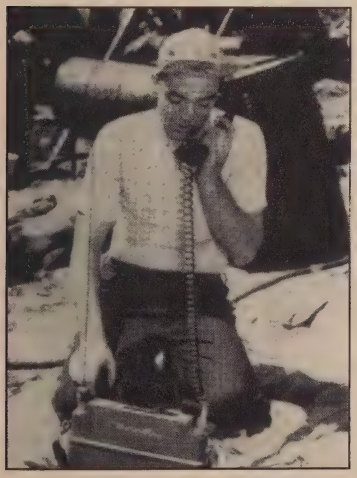
We always enjoy hearing from readers who embark upon research projects relating to communications facilities. Douglas G. Stingley, of Salem, Oregon, told us that he researched his city's first radio station, KFCD. He did this by sorting through microfilm newspaper records in the Reference Section of The Oregon State Library. Surprisingly enough, he turned up quite a bit of information about a relatively obscure station that existed only briefly in the very earliest days of broadcasting.

Doug's researched information was too lengthy to run here in its entirety, however he found out that KFCD started up on August 15th, 1922. The station used the common 833 kHz frequency. It was owned and operated by F.S. Barton, whose Salem Electric Co. sold Westinghouse and Magnavox radio receivers. The station was located in the Masonic Lodge building.

One problem with putting KFCD on the air was getting a licensed technician to be the station's Chief Engineer. That was solved when Barton hired C. Meredith Landaker, a 10th grade high school student who held a license and agreed to operate the station in exchange for being able to use the KFCD equipment to contact hams. He enjoyed contacts from Alaska to Louisiana via the KFCD facilities. KFCD's broadcast programming had a regular nighttime listener in Columbus, Montana.

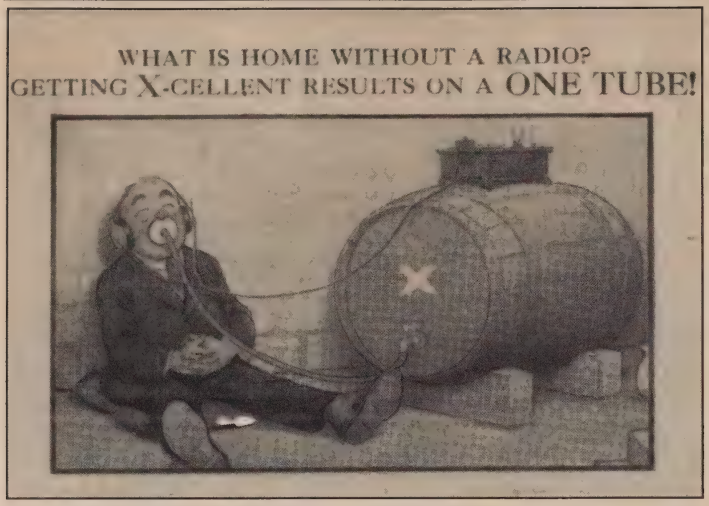
The station operated from the ground floor, and in front of a large window in order to allow for a passerby viewing audience. There were also some seats inside. Much of the programming consisted of local entertainment, primarily amateur and semi-professional. There were weather, market, news, and religious features. Yet, all did not go well for KFCD.

The KCFD antenna, atop the Masonic Lodge on the corner of High and State Streets, proved not to be in the best of all possible locations. Surrounding the station were four motion picture theatres that used carbon arc projection equipment that interfered with the station's signal. Also work-



The first commercial two-way FM portable was developed by Motorola in 1947 It used miniature tubes.

Motorola's SCR-300 'walkie-talkie' was the first two-way FM portable radio. It went into service 50 years ago.



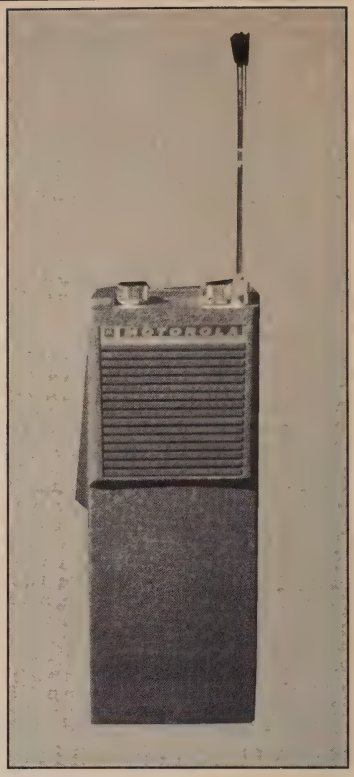
These gag postcards relating to the radio craze were the rage in the 1920's. (Courtesy Alexander Durant, New York.)

ing against the signal was a nearby 6 kW electric transmission line, plus electric street cars and elevator motors.

Two other factors didn't help, either. The daily afternoon newspaper, *Capitol Journal*, fought the station with a scare campaign centered on the many dangers to the public created by radio waves. These complications combined to deprive the station of support from the community, listeners, and any sponsors to keep it operating.

On January 26th, 1924, KFCD died from a lack of support. It had operated for only a year and a half. Salem was not to have another broadcasting station until station KSLM opened there eight years later, in 1932.

There were many unsung and obscure little pioneer stations such as KFCD at the dawn of broadcasting. They opened and closed in a twinkle, and were just as quickly forgotten. Thanks to Doug Stingley, who went to a library and researched the broadcast history of his own city, one more of these unremembered stations was recalled for the first time in 70 years. It's fun. Try it yourself!



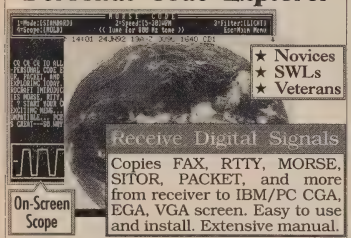
The Motorola HT200, introduced in 1962, was the first fully transistorized FM two-way portable.

Tower of Power

Last May, a piece of Denver's broadcasting history came to an end. The old KPOF/910 265-ft. tower was razed. This tower had overlooked metro Denver from one of its northern suburbs since 1935. Before that, it had been owned and used by a radio station in Philadelphia, but was taken apart and trucked to Denver for reassembly.

The tower served as KPOF's main tower until 1977, but at that time it was replaced by a new tower 1/4-mile east of the old one. The older tower remained in use only as a platform for several two-way radio antennas, but it was found to have become a problem.

Personal Code Explorer™



Copies FAX, RTTY, MORSE, SITOR, PACKET, and more from receiver to IBM/PC CGA, EGA, VGA screen. Easy to use and install. Extensive manual.

Personal Code Explorer also features user friendly menus, digital noise filters, global frequency lists and a FAX to GIF file converter. NOW SEE WHAT YOU'VE BEEN MISSING!

Personal Code Explorer - $129 S&H $4
Free Brochure. Call-Write-Order. MC/VISA.

Microcraft Corporation
Box 513PC, Thiensville, WI 53092
Phone (414) 241-8144

CIRCLE 74 ON READER SERVICE CARD

Secret Frequencies

The Remote Computer Scanning System™

Turn those hours of manually searching for secret frequencies over to RCSS™. The RCSS™ significantly enhances the ICOM™ R7000 receiver capabilities by providing automated PC control over receiver scanning & memory functions.

Features

- ❑ Automatic detection and storage of active frequencies & other info while scanning.
- ❑ User specified Tuning Steps from 10-100 MHz.
- ❑ Scan Mode, Class of Service, or Type of Unit.
- ❑ Scanning resumes upon loss of carrier.
- ❑ Memory capacity: 1,000 frequencies.
- ❑ Monitor half-duplex communications.
- ❑ Mouse/Keyboard driven graphic user interface.

SYSTEMS & SOFTWARE INTERNATIONAL, LTD.

4639 Timber Ridge Drive, Dumfries, VA, 22026-1059 USA
(703) 680-3559, Fax: (703) 878-1460. RCSS™ is available for both IBM compatible & Macintosh computers.

CIRCLE 86 ON READER SERVICE CARD

Due to its position near the newer tower, the older tower was causing unwanted radiation patterns. The older tower had to be equipped with a detuning device to eliminate this. Eventually, however, after so decades of exposure to the elements, the older tower had started to deteriorate. Technicians said it was no longer safe to climb. The only course of action was to take it down.

The top 5 ft. of the historic old KPOF tower was salvaged for placement in a history museum at the nearby Belleview School. The newer tower continues to operate with 5 kW on 910 kHz from high atop the station's hillside location overlooking the mile-high city.

KPOF is a religious station that began operating in 1928. The station is owned by the Pillar of Fire Church.

Events surrounding the demise of the KPOF tower were sent to us by Patrick Griffith, N0NNK, Federal Heights, Colorado. Patrick has been a long-time supporter of *POP'COMM*, and we appreciated his sharing this information with our readers.

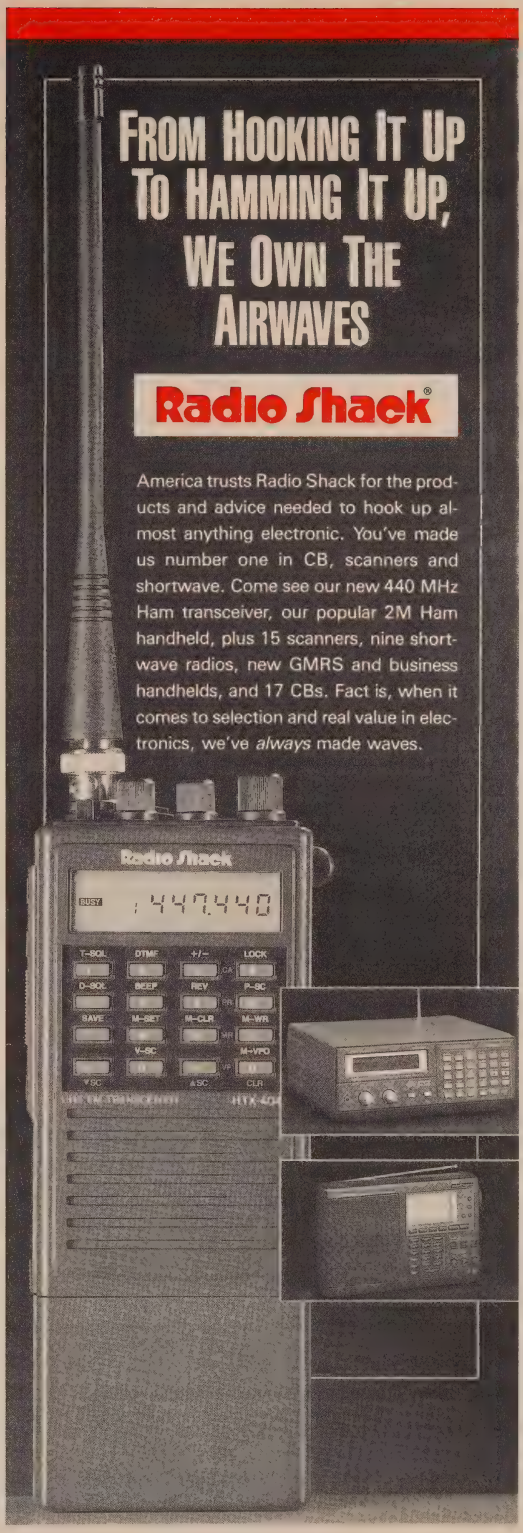
Octoberfest

Just in time for Octoberfest, a humorous 1926 radio-related postcard is submitted by another old friend, Alexander Durant, Albany, New York. This card depicts a contented radio listener in the era of one tube household radios. A pair of headphones connects his ears to his one tube receiver. In his mouth there's one tube, too. It's a rubber tube that connects his mouth directly to the tap on a wooden keg we presume is beer. The caption reads, "What is home without a radio? Getting X-cellent results on a ONE TUBE!'

In 1926, this card would have been thought of as 'naughty.' That's because Prohibition (18th Amendment, 1921) had made alcoholic beverages illegal. After broadcasting began in earnest (1922), one-tube receiving sets remained popular for several years. Therefore, the opportunity had become ripe for this clever double-whammy pun. It capitalized on the new broadcasting craze that was sweeping the nation, coupling it to a reference to the general public's virtually open and scornful disregard for Prohibition, and opposition to the law.

The hidden message: Notice that the man on the postcard is not a street person or derelict. He is well groomed, well fed, wears a suit and tie. He rests comfortably on a soft cushion. Thus, the card's artist was subtle in pointing out that dislike of Prohibition was the realm of the middle class.

Why not join us here next month? We thank you for helping us out with old time radio and wireless QSL's (photocopies or originals), clippings, station listings, questions, anecdotes, and what-have-you. ■


FROM HOOKING IT UP TO HAMMING IT UP, WE OWN THE AIRWAVES
Radio Shack
America trusts Radio Shack for the products and advice needed to hook up almost anything electronic. You've made us number one in CB, scanners and shortwave. Come see our new 440 MHz Ham transceiver, our popular 2M Ham handheld, plus 15 scanners, nine shortwave radios, new GMRS and business handhelds, and 17 CBs. Fact is, when it comes to selection and real value in electronics, we've *always* made waves.
Radio Shack
CIRCLE 80 ON READER SERVICE CARD

The Scramble Ramble

Communications Security in Law Enforcement.

BY JERRY CODY

Law enforcement people face situations that are more complicated and dangerous than in years past. Investigation and seizure of illegal drug, protection of witnesses in criminal prosecution, and security of government officials while travelling pose new challenges for law enforcement radio communications. With scanners available to the general public, police officers may face serious injury or even death if some of their radio communications are not kept secure *under certain conditions*.

In November of 1985, indisputable evidence was given to Congress that a group of drug smugglers in Southern Florida had the "unlisted" radio frequencies used by local and federal law enforcement officials. An *L.A. times/Washington Post* story reported a local official in Florida asserted these smugglers had ties to a Columbian terrorist group known at M-19. One hundred people including twelve justices are murdered on November 6, 1985, when M-19 seized the National Palace of Justice in Bogota.

In June of 1989, *The Associated Press* reported 3,685 pounds of cocaine destined for the United States was seized along with fourteen smugglers arrested by authorities in Mexico. These smugglers used communications equipment along with a computer to intercept telephone calls and operate a clandestine air traffic control center to aid in the transporting of drugs from Columbia. Evidence linked these smugglers to the infamous Medellin cartel.

In January 1992, another *L.A. Times/Washington Post* story revealed the F.B.I. had cracked a cocaine ring involving Los Angeles street gangs and the Medellin drug cartel. A continuous supply of high quality cocaine originating in Columbia, was transported to Mexico and then brought by automobile to Los Angeles. From that point, delivery was made to Anchorage, Dallas, Detroit, Honolulu, Houston, and Seattle. According to the F.B.I., the ring had distributed fifty tons of cocaine and made $30 million profit during the past ten years. The Los Angeles street gangs and Columbian drug dealers had easy access to portable "scanners" and cellular telephones to aid them in their operations. The Medellin as well as Cali drug cartels are responsible for approximately 80% of all cocaine coming into the United States.

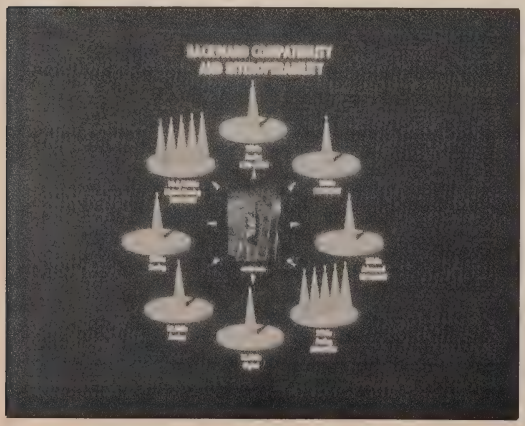
Many law enforcement agencies are using digital voice protection to secure sensitive radio communications. Police officers no longer have to rely on code words or crib sheets for communications security. A listener not having digital encryption equipment will only hear a rushing noise similar to a radio with the squelch not set and a tone.

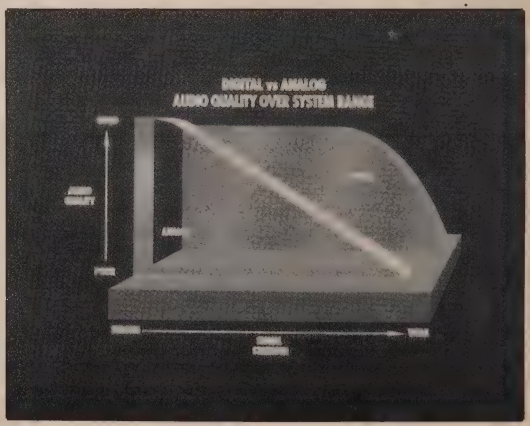
One voice protection system available to law unlighted is Motorola's "Securenet." "Securenet" uses a sophisticated encryption technique which is virtually impossible to break. The codes are mathematically unrelated and cannot by partially broken. To break into the "Securenet" system would require a computer checking every available code. At a rate of one million codes per second, the computer would take 75 million years to find the correct one. If a radio is lost or stolen, a "Securenet" code inserter can be used to insure the integrity of the system by changing the codes of the other radios in the network.

On August 29, 1991, Motorola announced a digital encryption platform known as "Astro." Previous encryption techniques required a slight reduction in audio quality for effective voice security because of variations in the RF signal. The "Astro" system will correct signal errors throughout the coverage area.

If a radio is lost or stolen in the "Astro" system, it can be remotely disabled and other radios in the network rekeyed. Over the air rekeying by computer could same lives in a critical law enforcement situation. Utilizing a computer in the "Astro" system allows the operator to know the status of every radio in the network.

In the heart of the "Astro" system is the





Motorola's ASTRO technology provides compatibility with existing Motorola analog conventional, Securenet digital and SMARTNET trunked radio systems

Vector Sum Excited Linear Predictive code process that takes the human voice and converts it into digital information. The V.S.L.E.P. voice coder actually simulates the human voice and creates digital information to allow the receiver to reproduce the voice sounds. "Astro" divides the voice message into small samples and extracts essential vocal parameters which describe how the sound was made. The pitch (created by the vocal cords), the filtering (created by the shape of the mouth), the energy (how loud the person is speaking), and other information describing the human voice are extracted and digitally encoded. V.S.L.E.P. compares the original voice sound with the digitized information from each sample and estimates the error or residual. The error describes the parts of the voice sound the digitization process could not recreate. Instead of ignoring the error as with previous encryption systems, "Astro's" vice coder uses a method that describes these residuals with a series of digital vectors. By matching the error with a series of digital vectors, the voice coder can develop a code word to describe the missing information. At the receiver, V.S.L.E.P. reconstructs the voice from the digital parameters and adds the coded error information to complete the reconstruction of the voice. Higher audio quality results.

Without secure communications in law enforcement, disaster could easily strike. An important government official could be assassinated or a dangerous criminal could go free because of a prosecution's witness being murdered. Secure radio systems such as "Astro" prevent tragedy from befalling police officers facing hostile times in our world today. ■

VIDEO SYNC GENERATOR

Restores Horizontal and Vertical Sync Lines from Distorted Analogue Video Formats

For Free Information Package on Completed Units and Pricing

VISA • Call 219-236-5776 • MasterCard

R.C. Distributing • PO Box 552 • South Bend, IN 46624

CIRCLE 76 ON READER SERVICE CARD

SHOCKING MANUALS!!

Survival Electronics, Computers, Security, Weaponry, Rocketry, Phones, Energy, Financial, Medical. 100+ offers include **Special Projects** and **Technical Research Services,** and **hardware. Confidentiality Guaranteed!** Send $4 for new **Combined Catalog.** By John Williams, former Senior Engineer (Lockheed), Professor of Computer Science (NMSU). As seen on CBS "60 Minutes." Since 1971

CELLULAR PHONE MANUAL: Detailed manual on how cellular phones are re-programmed (ESNs and NAMs) and scanned. 30+ cellular phone mods described. Specific scanner mods. $39.

VOICE MAIL BOX HACKING: Step-by-step descriptions of how 8 popular voice mail PBX systems are hacked. $29

BEYOND VAN ECK PHREAKING: Plans for surveillance systems some use to eavesdrop on TVs and computer monitors. $29.

SECRET & SURVIVAL RADIO: Detailed manual describes the optimum freqs, equipment, modes and circuits for secret, survival and security situations. Includes small transmitters and receivers; ultrasonic, infrared and fiberoptic comms; improvising and optimizing antennas. 70+ circuit diagrams. $29.

COMPUTER PHREAKING: Detailed manual describes both computer viruses and how computers are penetrated. Includes 2 PC disks [1] **FLUSHOT+** protection system. [2] Disk loaded with hacker files. $39

Many more: **STEALTH TECHNOLOGY** ($19), **PHONE COLOR BOXES** ($29), **TV DECODERS & CONVERTERS** ($14), **STOPPING POWER METERS** ($19), **RADIONICS MANUAL** ($29), **EM BRAINBLASTER** $29), **UNDER ATTACK** ($28), **HIGH VOLTAGE DEVICES** ($29), **DISK SERVICE MANUAL** ($29), **ATM** ($39). Include $4 S/H. Educational purposes only.

CONSUMERTRONICS

2011 CRESCENT, P.O. DRAWER 537, ALAMOGORDO, NM 88310

VOICE: (505) 434-0234, 434-1778 (8AM-9PM MST, Mon-Sat)

FAX: 434-0234 (orders only, 24-hours, 7 days/week. If you get answering machine press "#", then "1" any time).

CIRCLE 59 ON READER SERVICE CARD

World's Most Powerful CB and Amateur Mobile Antenna*

Lockheed Corp. Test Shows *Wilson 1000* CB Antenna Has 58% More Gain Than The K40 Antenna (on channel 40).

In tests conducted by Lockheed Corporation, one of the world's largest Aerospace Companies, at their Rye Canyon Laboratory and Antenna Test Range, the Wilson 1000 was found to have 58% more power gain than the K40 Electronics Company, K40 CB Antenna. This means that the Wilson 1000 gives you 58% more gain on both transmit and receive. Now you can instantly increase your operating range by using a Wilson 1000.

***Lockheed** - California Company*

A Division of Lockheed Corporation
Burbank, California 91520

Aug. 21, 1987

Wilson Antenna Company Inc.
3 Sunset Way Unit A-10
Green Valley Commerce Center
Henderson, Nevada 89015

Subject: Comparative Gain Testing of Citizen's Band Antennas
Ref: Rye Canyon Antenna Lab File #870529

We have completed relative gain measurements of your model 1000 antenna using the K-40 antenna as the reference. The test was conducted with the antennas mounted on a 16' ground plane with a separation of greater than 300' between the transmit and test antennas. The antennas were tuned by the standard VSWR method. The results of the test are tabulated below:

FREQUENCY (MHZ)	RELATIVE GAIN (dB)	RELATIVE POWER GAIN (%)
26.965	1.30	35
27.015	1.30	35
27.065	1.45	40
27.115	1.60	45
27.165	1.50	41
27.215	1.60	45
27.265	1.75	50
27.315	1.95	57
27.365	2.00	58
27.405	2.00	58

58% MORE POWER GAIN THAN THE K40

Individual test results may vary upon actual use.

Guaranteed To Transmit and Receive Farther Than Any Other Mobile CB Antenna or Your Money Back**

New Design

The Wilson 1000 higher gain performance is a result of new design developments that bring you the most powerful CB base loaded antenna available.

Why Wilson 1000 Performs Better

Many CB antennas lose more than 50% of the power put into them. The power is wasted as heat loss in the plastic inside the coil form and not radiated as radio waves.

We have designed a new coil form which suspends the coil in air and still retains the rigidity needed for support. This new design eliminates 95% of the dielectric losses. We feel that this new design is so unique that we have filed a patent application on it.

In addition, we use 10 Ga. silver plated wire to reduce resistive losses to a minimum.

In order to handle higher power for amateur use, we used the more efficient direct coupling method of matching, rather than the lossy capacitor coupling. With this method the Wilson 1000 will handle 3000 watts of power.

The Best You Can Buy

So far you have read about why the Wilson 1000 performs better, but it is also one of the most rugged antennas you can buy. It is made from high impact thermoplastics with ultraviolet protection. The threaded body mount and coil threads are stainless steel; the whip is tapered 17-7 ph. stainless steel. All of these reasons are why it is the best CB antenna on the market today, and we guarantee to you that it will outperform any CB antenna (K40, Formula 1, you name it) or your money back!

*Inductively base loaded antennas
**Call for details.

CALL TODAY
TOLL FREE: 1-800-541-6116
FOR YOUR NEAREST DEALER
Wilson 1000
Available in Black or White

Roof Top Mount	59.95
Trunk Lip Mount	69.95
Magnetic Mount	79.95
Wilson 2000 Trucker	59.95

DEALERS Exclusive dealer areas still open

Wilson
ANTENNA INC.
1181 GRIER DR., STE . A
LAS VEGAS, NV 89119

EMERGENCY

BY GORDON WEST, WB6NOA

COMMUNICATIONS FOR SURVIVAL

Professional communicators will regularly inspect the facilities of other emergency communications agencies to pick up valuable ideas and innovations on how to improve their own comm-center. "This is a great way to learn from other agency's mistakes," comments William Alber, an emergency communications specialist from the San Francisco Bay area.

In my own personal travels throughout the country working with emergency command posts, I never saw anything as elaborate and functional as one amateur operator's Dodge M37 military weapons carrier. Mounted on the vehicle is a communications shelter designated "AN/MLQ-24" counter measures receiving unit, capable of detecting frequencies from 30 MHz to 10.2 GHz and provided spectrum analysis, direction finding, and pulse-width/pulse-repetition rate, and rotation rate information on front line enemy battlefield radars.

This vehicle took 3½ years of restoration by amateur and commercial radio operator Patricia Gibbons, senior communications technician for the City of San Jose (WA6UBE/ N6LDL), California.

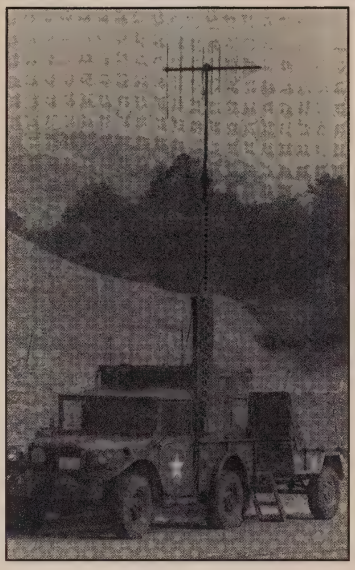
"Most of the original equipment in the shelter was an interesting curiosity. The power required to run it was very specialized. 28 VDC, 110 V 60 Hz AC, and 110 V 400 Hz AC was required to run the original gear," comments Patricia Gibbons. With ideas gleaned from the Military Vehicle Collector's Club and campouts with other military vehicle users, she converted the older military equipment over to the following line-up:

- RF Harris and SGC automatic antenna couplers.
- Two Yaesu 4700 dual—band mobile radios.
- Kenwood 3530A 220 MHz mobile radio.
- Yaesu FT70/G "Man Pack" radio for portable HF.
- Tandy 1400 LT laptop computer on military shock mounts.
- Kantronics TNC Kam unit.
- Dual crank-up towers with full rotator capabilities.
- Military log-periodic beam antenna.
- Create CLP5130 log-periodic antenna.
- ICOM portable handheld transceivers.

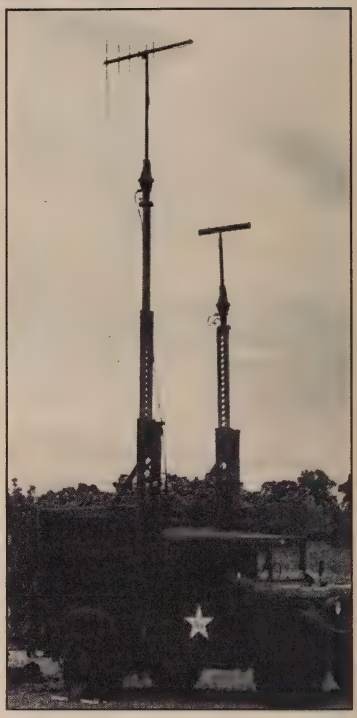
The towers collapse down and fold into the sides of the radio shelter. The tower bases have hinged mounts so that they stay attached to the shelter and are bolted down parallel to the truck bed when driving.

Motorola antennas are used throughout for the VHF and UHF bands. The vehicle trails an Army MEP16 3 KW generator and fuel supply for 24 hours of emergency operation.

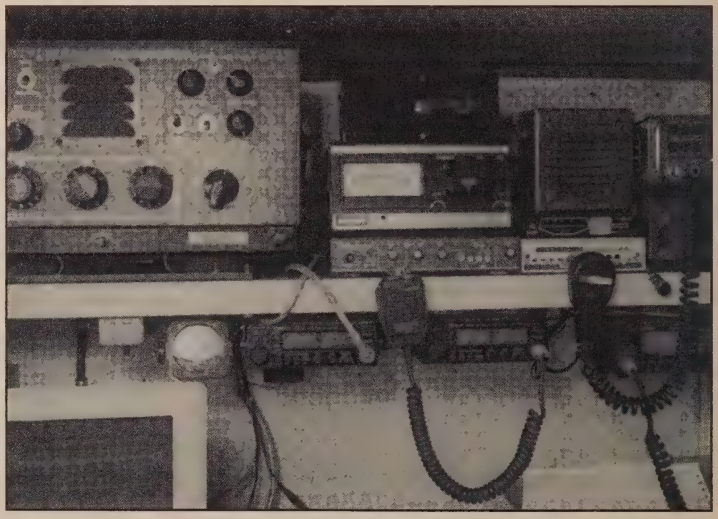
This vehicle was converted from 24 volts to 12 volts including two huge alternators and a battery isolator to keep the dual batteries fully charged.



The military radio command post, converted over to civilian use.



The log periodic beams can cover from 50 MHz–1296 MHz. They could also be phased for 3 db more gain.



An inside view of the military command post layout of ham and emergency radio equipment.

ACE COMMUNICATIONS
ACE Communications 800-445-7717
6975 Hillsdale Court Indianapolis, IN 46250

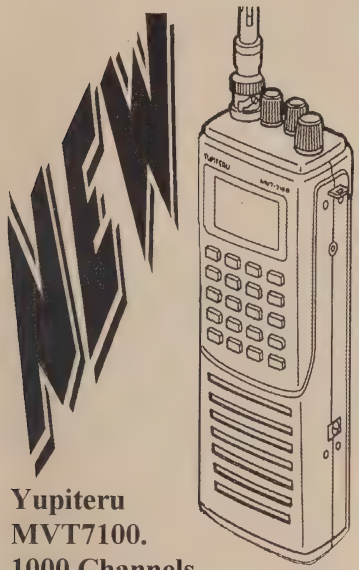
Get instant tech information FREE from your Fax or Computer!

You can obtain specs, freq. info, software and more from our automated services. For fax facts, call from your stand alone fax machine and follow the voice prompts. Use the BBS from your modem of fax/modem equipped computer. Dial 317-849-8683 for fax back service, or dial 317-579-2045 for our computer bulletin board service

PEACEMAKER SPECIAL

Go ahead, get one of those do everything receivers. Then try and explain the reasons for your purchase to the person who shares your checkbook or credit card. No fun, huh? Don't look forward to that prospect, do you? Well, maybe we can help a little by making it real easy for you to make a peace offering.

Here's the deal. When you order any unit over $250 from us, we'll kick in this nifty $49.95 SRP portable radio for only a paltry **$19.95** extra. It features AM/FM Stereo *and* VHF TV audio, 19 memories, auto-scan, and the stereo sound from the headphones is excellent. Plus, your mate can catch all the soaps in the afternoon, no matter where she is. So give us a call, order the receiver of your heart's desire and our peacemaker special.



Yupiteru MVT7100. 1000 Channels, 530KHz to 1650MHz with AM/FM/WFM/LSB/USB. $599.00

This is probably the best performing hand held receiver you can get, bar none. It combines great RF performance with full featured memory functions and *automatic* SSB selection. Other features include: lockout on search and scan, bank lockout, Backlighted LCD display, 1 year warranty, earphone jack, attenuator switch, delay, hold, priority and keylock controls. Plus a battery save function and a VFO tuning knob. Supplied with AC charger, Antenna with BNC connector, & rechargeable batteries. Size: 6 3/8H x 1 7/8W x 2 1/3D. Wt: 14oz. NFM I.F. filter ≈ ±7KHZ. SSB filter ≈ ±3KHz. More information: Fax fact doc. # 277

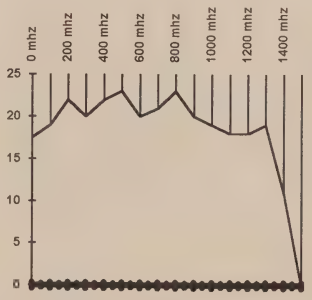
On Glass Scanner Antenna

Covers 25-1300MHz. Easy to install, no holes to drill. Includes all hardware for installation. Supplied with 15 feet of coax and BNC connector Adjustable whip angle. Very good performance with an easy to install permanent antenna for car or home. SGM-1 **$32.95**

AOR GW-2 GaAs FET Wide Band RF Pre-Amp

The GW-2 Wide Band Pre-Amp is designed to increase the signal levels present at the input to receivers, frequency counters, spectrum analyzers, etc. There are three basic advantages to the GW-2 design. 1. Wide range, low noise. Use of a GaAs Field Effect Transistor instead of the silicon FET's normally used in comparable devices for far less noise. 2. Variable Gain. Unlike many other signal amplifiers, the GW-2 allows you to vary the amount of gain it produces. 3. Portability. The GW-2 is completely powered by an internal 9 Volt DC standard transistor battery. The chart below shows typical maximum gain figures achieved by GW-2 over complete operating range.

Specifications:Input/Output Impedance: 50 Ω.



Gain: 20 dB nominal (-3 to + 20 adjustable). Input level: -5dbm max. Output level (1dB compression) +4 dbm. Noise figure (typical): 1.5db. Size: 3 1/4D x 4 3/4H x 7/8D. Wt 5 oz. Fax Facts #805 **$89.00** Also, if you have too many of the wrong kind of signals use our:

AOR MPIF-1 Interference Filter

Designed to reduce image and intermod in three areas: FM broadcast/TV, paging, and cellular. Small, convenient case with BNC connectors. Paging intermod filter is switchable. Fax facts # 905. Same size & wt. as GW2 above. **$59.00**

Toll Free, 24 Hours! ***800-445-7717*** *Fax Orders* ***800-448-1084*** *Fax Facts* ***317-849-8683***
Computer BBS Modem & Fax/Modem, **317-579-2045**. Toll Free Tech Support, Dial **800-874-3468**
International Fax: en *Espanol, en Francais, und auf Deutsch, or just fax in plain English to:* **317-849-8794**

ACE Communications 6975 Hillsdale Court, Indianapolis, IN 46250

Service & Support hours: Mon.-Fri. 9AM to 6PM, Sat. 10-4 EST. Mastercard, Visa, Checks, Approved P.O.'s & COD (add $5.50) & AMEX, Discover. Prices, specifications and availability subject to change. Flat rate ground shipping and handling charge only $5.95 per unit. Express Air only $8.95 , for most units, to most locations. One week trial, no returns accepted two weeks after original receipt without substantial restocking charge. All units carry full factory warranty. Indiana residents add 5 per cent sales tax.

FLY IT! ONLY $8.95

CIRCLE 117 ON READER SERVICE CARD

The Toughest Little "GUNN" in Town!

3 + 3 STAR

UPS SHIPPABLE

Other Models & Sizes Available in 10 or 11 Meters

MasterCard VISA DISCOVER

Call or send $2.00 for Complete Catalog and Pricing of Antennas.

JO GUNN Antennas

Route 1 – Box 32C, Hwy. 82
Ethelsville, AL 35461
(205) 658-2229
FAX: (205) 658-2259
Hours: 9 am - 5 pm (CST)
Monday - Friday

DEALER INQUIRIES, PLEASE CALL

SUPER 12 HOUR RECORDER

CALL TOLL FREE

Modified Panasonic
Slimline. 6 hrs per side.
120 TDK tape furnished.
AC/DC Operation.
Quality Playback.
Digital Counter.
Durable Lightweight Plastic.

$119.00*

PHONE RECORDING ADADPTER

Starts & Stops Recorder Automatically When Hand Set is Used.
Solid State!

FCC APPROVED

$28.50*

VOX VOICE ACTIVATED CONTROL

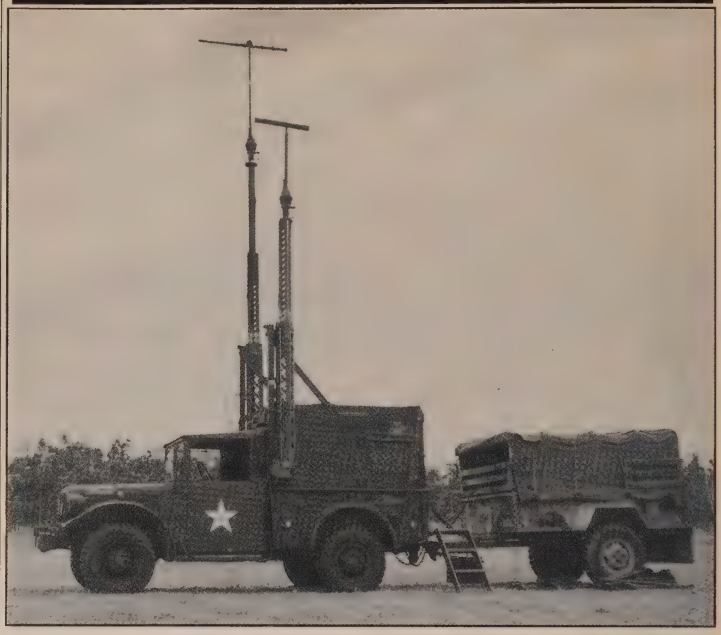
Solidstate Adjustable Sensitivity. Voices & Sounds Activate Recorder. Adjustable Sensitivity. Provisions for Remote Mike.

$28.50*

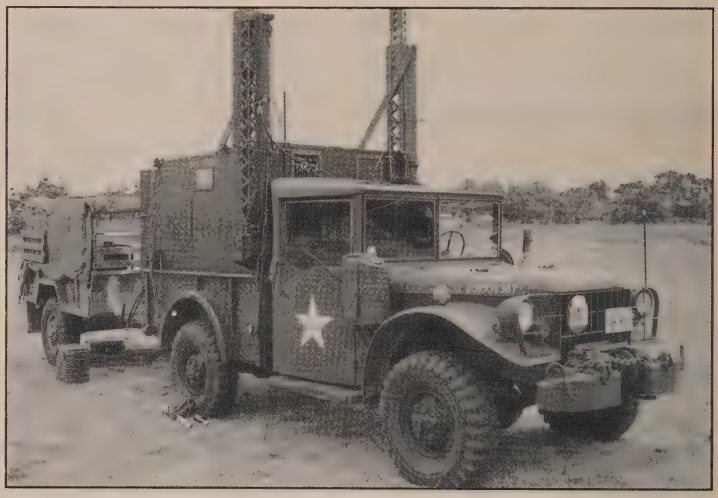
*Add for ship. & handling. Phone Adapter & Vox $2.00 each, Recorders $5.00 each, Colo. Res. add tax. Mail Order, VISA, M/C, COD's OK. Money Back Guar. Qty. Disc. available. Dealer inquiries invited. Free data on other products.

ALL MAIL TO: Box 20100, Boulder, CO 80308
AMC SALES INC., 193 Vaquero Dr.,
Boulder, CO 80303
Phones (303) 499-5405 • 1-800-926-2488
FAX (303) 494-4924 • Mon-Fri 8-5 MTN. TIME

CIRCLE 51 ON READER SERVICE CARD



The utility trailer also contains the generator.



The twin towers are always retracted when the vehicle is in motion.

"I am a firm believer in having HF radio capabilities in an emergency situation," comments Patricia. "Another major quake in the Santa Clara Valley area like our Loma Prieta quake of 1989 could knock out strategically located 2-meter and 440 MHz repeaters that are relied upon by our county-wide ARES/RACES program," she adds, backing up the need for HF communications which will not require repeaters.

Her vehicle and antennas may also operate near vertical incident skywave, ideal for staying in close contact on 40 and 80 meters. NVIS techniques have been emphasized in the design of the equipment layout, and are essential for emergency communications.

"This vehicle was not put together for the purpose of working DX on field day—this vehicle is outfitted for emergency drills and the real thing," adds Gibbons.

All Photos Courtesy Of Marc Goldman, WB6DCE

"The R8 is a highly sophisticated receiver. We'd call it professional grade, or about as close to it as receivers get these days."

Staff review
Popular Communications

"The R8 is like a breath of fresh air, with its ground-up engineering and up-to-date digital control from the front panel. I am very pleased to see a quality HF receiver of American manufacture that should successfully compete on the world market."

Bill Clarke
73 Amateur Radio Today

"Overall, the Drake R8 is simply the best radio we have ever tested for quality listening to programs... There's nothing else quite like it."

Lawrence Magne
Monitoring Times

"The best of the best for high-quality listening to news, music and entertainment from afar. Superb for reception of faint, tough signals, too."

Editor's Choice
Passport to World Band Radio
Tabletop Receivers for 1992

The ears have it!

When we introduced the American-made R8 Worldband Communications Receiver, we knew it would be judged by some very discerning ears, experts accustomed to the finest in short-wave listening equipment from around the world. After listening to the world on the Drake R8 loud and clear, they have delivered a decisive verdict.

They appreciated the R8's sensitivity, clarity, simplicity, and all-around versatility so much that many of them declared the R8 simply the best of its class. High praise, indeed, from very well-traveled ears.

But why take the word of mere experts? Put the Drake R8 to the test yourself with a 15-day money-back trial period on factory direct purchases, and let your ears be the judge. If you're not impressed by Drake's quality, performance and ease of operation, all in a receiver costing less than $1,000.00, return the R8 Receiver within 15 days, and we'll refund your money in full, less our original shipping charge. To order your R8 factory direct, for more information, or for the dealer nearest you, call **1-800-937-2538** today. We're confident that once you've listened to the R8, your ears will hear of nothing else.

R.L. Drake Company
P.O. Box 3006
Miamisburg, OH 45343
U.S.A.

DRAKE
In touch with the world.

CIRCLE 142 ON READER SERVICE CARD

Portable Satellite Telephone System Becomes A Star

BY DEENA MARIE AMATO, Associate Editor

Magnavox introduced the *MAGNA phone MX-2020P,* the world's most compact and lightweight single case Inmarsat-A, Class 1 SATCOM terminal. Using this 42 lb. transceiver, with its 3 ft. collapsible umbrella antenna, it is possible to use the keypad to dial up any telephone in the world for a full duplex conversation, or send electronic mail at 9600 bps.

Inmarsat communications satellites offer worldwide coverage. The uplinks are in the 1635.5 to 1645.0 MHz band. Downlinks are in the 1535.0 to 1543.5 MHz band.

MAGNAphone MX-2020P received nationwide exposure when it appeared "on-screen" with actor Steven Seagal in the Warner Brothers 1992 high-tech thriller, *Under Siege.*

"It is a MAGNAphone MX-2020P....It has satellite security uplinks....it's like a carphone...," Mr. Seagal explains to his female co-star during a scene in the fast–paced motion picture.

Steven Seagal, the 6 ft. 4. in. star portraying highly decorated US Navy SEAL Casey Ryback in the film, was often seen on the deck of a US Navy ship making ample use of the satellite phone. The communications device was also handy after hours, as it was actually used by both the film's cast and crew during breaks in the shooting schedule.

The film's story concerns terrorists aboard the battleship *USS Missouri.*

BEST RECEIVER 1992
WRTH
Don't wait for "film at eleven"!
Introducing the award-winning FRG-100 Communications Receiver.
Why wait for someone else to tell you what's happening in the world when you can find out first hand?
Have all the hottest news – not just "bites". Listen to music pulsating through Europe. Monitor economic trends in industrialized nations. Eavesdrop on Third World country survival efforts. Track vital crisis developments during conventional communications breakdowns. Or "drop in" to your old neighborhood – even if it's 12 time zones away.
The FRG-100 is loaded with technical advancements like industry-exclusive adjustable SSB carrier offset and user selectable 10Hz, 100Hz or 1 KHz tuning steps. The exciting Broadcast Band mode with 16 pre-programmed international broadcast bands. 50 Memory Channels and twin 12/24 hour clocks to keep you tuned in where and when you like day or night!
Consistent with Yaesu's world-renown reputation for radio communications achievements, the FRG-100 won the prestigious *World Radio TV Handbook* award for "Best Communications Receiver" upon its introduction in December, 1992. But you're the *real* winner! Priced lower than receivers costing much more but with fewer features, the FRG-100 delivers extraordinary and affordable performance. Ask about the FRG-100 and it's remarkable low price at your Yaesu dealer today. Make up your own mind about world events. Find out first hand!
YAESU
*Performance without compromise.*SM
S
SIGNAL
AM
VFO
11.845.00
50CH
YAESU
COMMUNICATIONS RECEIVER FRG-100
POWER
ATT
6dB
12dB
VFO /MEM
MEM CLEAR
VFO ►MEM
MEM ►VFO
LOCK
NB
AGC-F
CLOCK
TIMER
SEL
SET
SSB
CW/N
AM/N
FM
PHONES

© 1993 Yaesu USA, 17210 Edwards Rd., Cerritos, CA 90701 (310) 404-2700
Specifications subject to change without notice. Some accessories and/or options are standard in certain areas. Check with your local Yaesu dealer for specific details.

"The Largest Dealer of Scanners in the World"

SCANNER WORLD, USA®

Scanner World, USA

10 New Scotland Ave., Albany, NY 12208 • 518-436-9606

SCANNER WORLD EXCLUSIVE

UNIDEN BEARCAT BC205XLT

$239.99 *($8.00 shipping)*

Digital programmable 200 channel hand held scanner with raised button keyboard for easy programming of the following frequency ranges: 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-956 MHZ.* Features include: Scan delay, memory backup, key pad lock, sidelit liquid crystal display, channel lockout, 10 twenty channel banks, direct channel access, automatic search, full one year factory warranty, 10 priority channels, Ni-Cad battery pack, AC adapter/charger, flexible rubber antenna carry case are all included. Size is 2-11/16"W x 1-3/8"D x 7-1/2" high.

(*Excludes Cellular)

#CC-008 Heavy Duty Leather Carry Case . . **$27.99**

RADIO SCANNERS

BEARCAT BC55XLT	99.99	(7.00)
BEARCAT BC70XLT	129.99	(7.00)
BEARCAT BC100XLT	159.99	(7.00)
BEARCAT BC142XL	83.99	(6.00)
BEARCAT BC148XLT	104.99	(7.00)
BEARCAT BC200XLT	279.99	(7.00)
BEARCAT BC205XLT	239.99	(8.00)
BEARCAT BCT2	149.99	(7.00)
BEARCAT BC350A	129.99	(7.00)
BEARCAT BC400XLT	99.99	(7.00)
BEARCAT BC560XLT	109.99	(7.00)
BEARCAT BC700A	199.99	(7.00)
BEARCAT BC760XLT	249.99	(7.00)
BEARCAT BC800XLT	229.99	(8.00)
BEARCAT BC855XLT	179.99	(8.00)
BEARCAT BC2500XLT	369.99	(9.00)
BEARCAT BC890XLT	284.99	(8.00)
COBRA SR901	74.99	(6.00)

CB Radios	*In Stock*
Two-Way Radio Batteries	*In Stock*
Scanner Antennas	*In Stock*
Power Supplies	*In Stock*

SCANNER ACCESSORIES

BCAD70	14.99	BP4	24.99
BCAD100	14.99	BP55	16.99
BCAD140	14.99	MA917	26.99
BCAD 580	16.99	MA518	14.99
BC003	7.99	ESP25	16.99
BC002	59.99	GRE8002	79.99
PS001	12.99	GRE-HH	54.99
UA502A	12.99	GRE9001	89.99
BP205/200	34.99	GRE 3001	62.99
BP70	16.99	FBE	5.99
VC001	12.99	FBSW	5.99

★ ALL MERCHANDISE NEW, IN FACTORY SEALED CARTONS

BOOKS

Scanner Master	29.95
Covert Intelligence	8.95
Air Scan Directory	14.99
Betty Bearcat	5.99
Top Secret (8th)	18.99
Covert Techniques	9.95
Tomcat's Big CB	13.95
World Radio	18.99
Survival Directory	6.95
Rail Scan	7.95
Monitor America	24.99
Police Call	9.29
Scanner Modification	17.99

RELM RH-256NB HIGH BAND TWO-WAY RADIO

SPECIAL PACKAGE DEAL

$339.99 *(Plus $9.00 Shipping Each)*

16 channel digital readout two-way radio. Covers high band frequency range of 148-162 MHz without returning. Perfect two-way radio for ambulance, police, fire, tow trucks, taxis, commercial companies who use this band. Features include CTCSS tones built-in, priority, 25 watts output, channel scanning, back-lighted keyboard, message light, time out timer, scan delay, external speaker jack. Size is 2¼"H x 6½"W x 10¼"D.

SPECIAL PACKAGE DEAL includes RH-256NB, mobile microphone, 1/4 wave body mount antenna, mobile mounting bracket and mobile power cord, all for the low price of $339.99.

UNIDEN BEARCAT BC-400XLT

$99.99 *($7.00 Shipping)*

Our best selling mobile scanner. 16 channel AC-DC programmable digital. AC-DC cords, telescopic antenna, mobile mounting bracket, weather search priority. 29-54 MHz, 136-174 MHz, 406-512 MHz, external speaker and antenna jacks.

BEARCAT BC-100XLT

100 Channel Digital Programmable Hand-Held Scanner

$159.99 *($7.00 Shipping)*

Our best price ever on a full featured complete package hand-held scanner. Manufactured by Uniden. Features include 11 bands of weather, aircraft, public service, trains, marine, plus more (29-54 MHz, 118-174 MHz, 406-512 MHz). 10 channel banks, 10 priority channels, lighted LCD display, earphone jack, channel lockout. AC/DC operation, scans 15 channels per second, track tuning. Special package deal includes the following accessories: AC adapter/charger, rechargeable Ni-Cad battery pack, flexible rubber antenna, carry case.

Uniden®/Bearcat BC-142XL

10 Channel Base/Mobile Programmable Scanner

$83.99 *($6.00 Shipping)*

Programmable, digital, AC or DC operation, weather button, priority, lockout button, squelch, memory backup, 2 digit LED display, track tuning, 2 second built-in delay. Frequency coverage 29-54 MHz, 136-174 MHz, 406-512 MHz. Sizes 9"x6½"x2¼". Includes AC adapter and telescopic antenna.

Optional Cigarette Lighter Cord #142MPC . $4.99

Bearcat BC-148XLT

$104.99 *($7.00 Shipping)*

16 channel with Automatic Weather Alert (similar to BC-147XL).

SPECIAL!! LOWEST PRICE EVER FOR A PROGRAMMABLE SCANNER

Cobra

SR-901

AVAILABLE ONLY FROM SCANNER WORLD

ONLY! **$74.99** Each

(Plus $6.00 Shipping Each)

$69.99 (2 or more)

Features include: 10 programmable channels, one touch memory programming, external speaker jack, 29-54 MHz, 136-174 MHz, 400-512 MHz, squelch, lockout, full frequency digital readout, AC or DC operation, retains memory up to 3 days without power, scan button. Includes AC adapter, telescopic antenna, and complete operating instructions. Size: 7¼" W x 2" H x 7¼"D. One year factory warranty.

Optional mobile cigarette lighter cord #901MPC . . $4.99

UNIDEN BEARCAT BC 800XLT

DIGITAL BASE SCANNER

$229.99 *($8.00 Shipping)*

Receive police, fire, ambulance, cordless phones, marine, trains, weather, ham, stock cars, public service plus much more. Frequency coverage 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-912 MHz (continuous). 40 channels, AC/DC operation, digital programmable, memory backup requires 2 AA batteries (not included), telescopic antenna included, AC power cord included, external speaker jack, external antenna jack. Dimensions: 9¼"D x 4½"H x 12½"W. Channel lockout, direct channel access, scan delay, priority, digital display, auto weather button, automatic search, track tuning.

UNIDEN BEARCAT BC-760 XLT

$249.99 *($7.00 Shipping)*

Digital Programmable 100 Channel Scanner

BC760 XLT covers the following frequencies: 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-954 MHz (excludes cellular). Features compact size of 6-5/16"W x 1-5/8"H x 7-3/8", scan delay, priority, memory backup, channel lockout, bank scanning, key lock, AC/DC power cords, telescopic antenna, mounting bracket supplied, one year factory warranty, search, direct channel access, track tuning, service search including preprogrammed frequencies by pushing a single button for police, fire emergency, aircraft, weather, and marine services puts exclusive optional features never available on any scanner before. First is an RF receive amplifier for boosting weak signals for only $34.99 plus a CTCSS tone board is available for only $59.99 to make this the number one scanner available in the USA.

Optional cigarette lighter plug #760MPC . $4.99

UNIDEN MR 8100A

SPECIAL SALE PRICE ONLY **$289.99** *($10.00 Shipping Each)*

100 channel digital programmable mobile scanner, turbo scan up to 100 channels per second, lockout, priority, built-in automatic 2 second delay, dimmer control, back-lighted keyboard, track tuning, direct programming of frequencies from front keyboard plus you can also program MR8100 from your IBM compatible PC computer with software and cables included with scanner from Scanner World. Frequency coverage: 29-54 MHz, 118-174 MHz, 406-174 MHz, 406-512 MHz, 806-956 MHz. Dimensions: 7.8"W x 5.8"H x 1.9"D. Earphone jack, BNC antenna jack, DC power cord, mobile mounting bracket, internal memory backup, bank scanning, 10 banks of 10 channels in any combination.

MODEL: FB-911

FIRE BOX PHONE

$45.99 *($5.50 Shipping Each)*

13 memory phone, 3 direct access emergency memories, auto redial, ringer on/off, top light flashes when telephone is ringing, tone/pulse switchable, desk/wall mount, front door closes for authentic fire box appearance. FCC approved. Size 16"H x 8½"W x 7"D.

GM-1™ GLASS MOUNT SCANNER ANTENNA

Frequency coverage 25-1200 MHz — only 22 inches tall. — No holes to drill — includes contact glue pads for easy installation. Complete with 17 foot cable, Motorola connector, and mounting hardware. Swivels to vertical position — performance unaffected by moisture on the window. Made in USA.

SPECIAL

$39.99 *($4.00 Shipping Each)*

GLASS MOUNT ANTENNAS FOR TRANSCEIVERS

Includes mounting kit and cable. Low band, High band and UHF band include PL259 connectors. 800 cellular band antenna includes TNC connector.

GM-27	27 MHz Low Band for CB	$39.99 ($4.00)
GM-155	144-174 MHz High Band	$39.99 ($4.00)
GM-450	450-470 MHz UHF Band	$39.99 ($4.00)
GM-800	Cellular Telephone Band	$34.99 ($4.00)

ORDERING INFORMATION: Call (518) 436-9606 to place orders or mail orders to Scanner World, USA®, 10 New Scotland Ave., Albany, N.Y. 12208. Orders will be shipped within 24 hours by United Parcel Service if order is accompanied by MasterCard, Visa, cashier's check, money order, COD (COD shipped by United Parcel Service will be cash or money order only). (If a COD package is refused, customer will be billed for shipping and COD charges.) Mail orders with personal or business checks enclosed will be held 4 weeks for bank clearance. Prices, specifications, and terms subject to change without prior notice. If items are out of stock we will backorder and notify you of delivery date. All shipments are F.O.B. Scanner World® warehouse in Albany, N.Y. We are not responsible for typographical errors. All merchandise carries full manufacturer's warranty. Bid proposals and purchase orders accepted from government agencies only. Free full line catalog mailed 4 times per year. Merchandise delivered in New York State add your local sales tax. No returns accepted after 7 days of merchandise receipt. * Add ($) per item, and $4.00* for all accessories ordered at same time. COD orders will be charged an additional $4.95 per package. Full insurance is included in shipping charges. All orders are shipped by United Parcel Service to street address only. (No P.O. Box). Shipping charges are for the 48 continental US States only: Alaska, Hawaii and all others ask for quote on shipping charge.

Scanner World, USA® •10 New Scotland Ave., Albany, NY 12208 • 518-436-9606

POPULAR COMMUNICATIONS

FREE READER SERVICE CARD

ENTER MONTH AND YEAR OF THIS ISSUE:

Month _____ Year _____

(REQUESTS CANNOT BE PROCESSED WITHOUT DATES)

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81	82	83	84
85	86	87	88	89	90	91	92	93	94	95	96
97	98	99	100	101	102	103	104	105	106	107	108
109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132
133	134	135	136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153	154	155	156
157	158	159	160	161	162	163	164	165	166	167	168
169	170	171	172	173	174	175	176	177	178	179	180

Was this issue of Popular Communications addressed to you? **Yes** ☐ **No** ☐

Name _____

Company Name _____

Address _____

City _____ **State** _____ **Zip** _____

(Please note: This card expires 3 months from cover date.)

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 31, DALTON, MA

POSTAGE WILL BE PAID BY ADDRESSEE

POPULAR COMMUNICATIONS

Reader Service Dept.
P.O. Box 5115
Pittsfield, MA 01203-9935

BROADCAST DX'ING

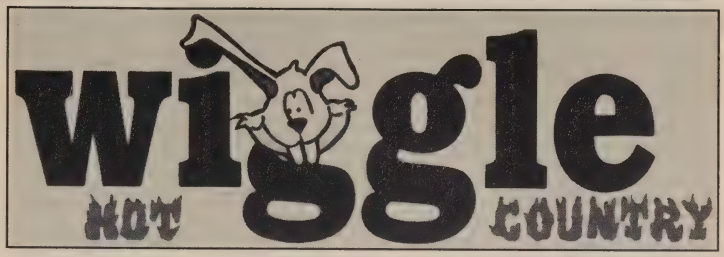
BY ROGER STERCKX, KVT1JH

DX, NEWS AND VIEWS OF AM AND FM BROADCASTING

Radio Soleil d'Haiti: A few issues back we mentioned that Radio Soleil d'Haiti, Brooklyn, N.Y., operates on 97.7 MHz, but that we couldn't find it listed in any station directories. We assumed it wasn't licensed. That was only sort-of correct.

A letter from Louis Sicilia, Fairview, N.J., advises that he has monitored 97.7 MHz for the French/Creole language station and has not been able to pick it up. It is Louis' information that the station is transmitted on the 67 kHz subcarrier of a New York City Spanish language station, WSKQ-FM/97.9. Thanks for providing us with this information, Louis!

Louis further tells us that New York City's WMXV/105.1 (*Mix 105*) carries WHTZ/100.3 on their 92 kHz subcarrier during the WHTZ "Love Phones" program (10 p.m. to Midnight, Monday to Thursday). WHTZ runs the lively program with a 10-second delay, but the WMXV subcarrier plays it while it's happening. No delay or bleeped words.



A clever bumper sticker from WYGL ("Wiggle"), Selinsgrove, Penna. doesn't show a frequency. Not enough room for its 3 frequencies, 1240 kHz, 92.3 FM, and 100.5 FM. (Courtesy Larry Gotts, Richfield, Penna.)

Our Opinion: John Alldredge, Buffalo, N.Y., dropped us a letter to ask if we can tell him anything about the mediumwave signal improving device called the *Select-A-Tenna* and if it does what is claimed.

The *Select-A-Tenna* is intended to improve mediumwave (530 to 1705 kHz) reception. It is designed for and best used with receivers having their own built-in antennas, such as all-band or AM/FM portables, and household clock and table-radios. It may not do much, or anything, for communications receivers and other types of sets requiring external antenna systems.

Applications Filed For New FM Stations

AK	Tetlin	103.3 MHz	
AL	Dothan	90.3 MHz	3kW
FL	Crystal River	90.3 MHz	3 kW
FL	Monticello	91.9 MHz	3kW
IA	Decorah	104.7 MHz	4.5 kW
ID	Boise	88.7 MHz	6 kW
IL	Arlington Hts.	88.3 MHz	1 kW
IN	Walton	93.7 MHz	6 kW
LA	Ruston	99.5 MHz	3.1 kW
MI	L'Anse	106.1 MHz	50 kW
MN	Proctor	107.7 MHz	770 watts
MO	Cuba	90.3 MHz	7 kW
MO	Wheeling	105.9 MHz	6 kW
NE	Chadron	94.7 MHz	50 kW
NM	Grants	92.7 MHz	50 kW
NY	Mexico	103.9 MHz	3 kW
NY	Norwood	96.1 MHz	6 kW
OR	Canyon City	94.5 MHz	19 kW
PA	New Castle	90.1 MHz	4.6 kW
PR	Culebra	89.3 MHz	30 kW
WA	Levenworth	97.7 MHz	6 kW
WI	Reedsburg	102.9 MHz	3.6 kW

Changed AM Facilities

KAMD	Camden, AR	910 kHz	Now 1 kW/125 watts.
KDOV	Phoenix, OR	1300 kHz	Increased days to 20 kW.
KDYL	Salt Lake City, UT	1280 kHz	Increased to 10/6 kW.
KENO	Las Vegas, NV	1460 kHz	Increased days to 30 kW.
KKMC	Gonzales, CA	880 kHz	Moved to Del Rey Oaks, 50/25 kW.
KOJY	Costa Mesa, CA	540 kHz	Use 240 watts daytime.
KOQI	Soquel, CA	1200 kHz	Increased to 50/11 kW.
KXEM	McFarland, CA	1590 kHz	Moved to Bakersfield, 750 kHz, 6/3 kW.
WASG	Atmore, AL	550 kHz	Increased daytime to 25 kW.
WGOC	Blountville, TN	640 kHz	Increased daytime to 10 kW.
WQBS	San Juan, PR	870 kHz	Dropped to 9.6 kW.

Permits Issued to Construct New FM Stations

AR	Maumelle	96.9 MHz	3 kW
AR	Osceola	107.3 MHz	3 kW
CA	Santa Ynez	105.9 MHz	3 kW
CA	Seaside	103.5 MHz	3 kW
DE	Fenwick Isl.	92.1 MHz	3 kW
FL	Jupiter	99.5 MHz	3 kW
GA	Greenville	95.7 MHz	6 kW
GA	Tennille	99.9 MHz	8 kW
IA	Des Moines	107.5 MHz	50 kW
IA	New Sharon	99.9 MHz	25 kW
IN	Chandler	93.5 MHz	3 kW
IN	Walton	93.7 MHz	
KS	Andover	93.9 MHz	25 kW
KS	Horton	93.7 MHz	25 kW
LA	Baker	107.3 MHz	3 kW
LA	Richwood	100.9 MHz	6 kW
MI	Bay City	89.1 MHz	2 kW
MI	Pickford	105.5 MHz	6 kW
MS	Starksville	91.1 MHz	14.1 kW
MT	Kalispell	106.3 MHz	3.9 kW
NC	Harkers Isl.	100.3 MHz	3.9 kW
NC	Orcacoke	92.9 MHz	1 kW
NY	Binghamton	91.5 MHz	1.5 kW
OH	Reading	89.3 MHz	340 watts
WI	Appleton	91.9 MHz	3.3 kW
WI	Whitewater	106.5 MHz	3 kW

Applied to Change AM Facilities

KCTY	Salinas, CA	950 kHz	Seeks to increase to 10 kW.
KFFA	Helena, AR	1360 kHz	Seeks to drop to 90 watts (nights).
KORC	Waldport, OR	850 kHz	Seeks move to 820 kHz, 1 kW/100 watts
KTBR	Roseburg, OR	950 kHz	Seeks 180 watts (nights).
KYLR	Huntsville, TX	1400 kHz	Seeks 1 kW.
WSCR	Chicago, IL	820 kHz	Seeks 1 kW.
WWGM	Nashville, TN	1560 kHz	Seeks move to Gallatin, 1.5 kW (days).
WXLI	Dublin, GA	1230 kHz	Seeks drop to 700 watts.

Requested AM Call Letter Changes

Now	Seeks	
WLVX	WRDM	Bloomfield, CT
WSMA	WIFN	Marine City, MI

Changed AM Call Letters

New	Was	
KBBA	KEYJ	Abilene, TX
KBIL	KSTB	Breckenridge, TX
KEYQ	KFSO	Fresno, CA
KRXX	KMZZ	Minneapolis, MN
KBBI	WKMW	Madison, AL
WBEB	WEAZ	Philadelphia, PA
WCMF	WRMM	Rochester, NY
WEZK	WIMZ	Knoxville, TN
WFRG	WZLB	Rome, NY
WKDR	WDOT	Burlington, VT
WNCM	WQBR	Atlantic Beach, FL
WNXW	WKDR	Plattsburgh, NY
WWPG	WNPT	Tuscaloosa, AL
WWSN	WDJX	Louisville, KY

Requests For Changed FM Call Letters

Now	Seeks	
KFAY-FM	KREB	Huntsville, AR
KGKO-FM	KMVK	Benton, AR
KMXI	KKBK	Lake Oswego, WI
KNJM	KSND	Lincoln City, OR
KQEZ-FM	KAZR	Coolidge, AZ
WJZE	WBIG-FM	Washington, DC

Applied to Change FM Frequency

WNHU	Renovo, PA	101.5 MHz	Seeks 106.9 MHz, 5.8 kW.

Changed FM Frequencies

KAYZ	El Dorado, AR	103.1 MHz to 103.3 MHz, 100kW.
KBST	Big Spring, TX	95.3 MHz to 95.9 MHz, 7 kW.
KMTB	Murfreesboro, AR	95.3 MHz to 99.5 MHz, 20.5 kW.
KXFE	Dumas, AR	107.1 MHz to 106.9 MHz, 25 kW.
WDYL	Chester, VA	92.1 MHz to 93.1 MHz, 1.35 kW.
WKZC	Scottsville, MI	95.9 MHz to 94.9 MHz, 17 kW.
WSOS	St. Augustine, FL	105.5 MHz to 94.1 MHz, 10 kW.

The *Select-A-Tenna* comes fully assembled. It is about 11-in. round, by 2-in. deep, and you are supposed place it next to the receiver. It doesn't require any power or batteries, nor wiring connections to the receiver. Depending slightly upon receiver antenna size and frequency, the field effect gain at typical at mid-band from the *Select-A-Tenna* is +13 dB.

We have found that the *Select-A-Tenna* works fine and significantly improves reception when used with receivers having internal antennas. It boosts night reception when local stations sign off and distant stations aren't strong enough to be pulled in, or when fading is severe. Enhances AM stereo signals by helping signals without significant noise. It also improves adjacent channel rejection.

The *Select-A-Tenna* works by creating a powerful localized RF energy field immediately surrounding itself. It may be peaktuned to specific frequencies by using the dial on the device.

The *Select-A-Tenna* is sold nationally. Several *POP'COMM* advertisers offer this useful device.

Classic Radio: New York City's WQEW/1560 plays old time recordings and radio programs on Saturdays from 7 to 11 p.m. Eastern, also Sundays, 8 to 11 p.m. Eastern Time. The recordings are from the 1925 to 1955 era.

We thank Charles Emanuelli, Saugerties, N.Y., for passing this along.

St. Louis Blues: Two shock radio deejays at St. Louis, Mo., FM station WKBQ 9 *Q-106* found themselves in the center of a controversy. Ultimately, they also found themselves unemployed.

These air personalities were the hosts of a popular morning program called "The Steve and D.C. Show." The problems began after a listener who phoned the show was called an offensive word with an ethnic context. After this went out over the air, civil rights and religious leaders complained so loudly that a number of sponsors decided to withdraw their support of the program.

People said that the use of ethnic slurs was nothing new to the program, and that it had been going on for many months. At least 16 previous complaints regarding this had been sent to the FCC. Still, the team had attracted a large audience with their show.

With the loss of the sponsors, the firings followed soon after. The two deejays expressed regret for insulting the caller, saying that they came to realize that what they had said was hurtful. They wanted to apologize to any listeners who had been offended.

The station announced it was suing the two deejays, alleging that their ethnic slur

Exterior of WSLM, Salem, Ind. This station operates on 1220 kHz and 98.9 FM. (Photo by R.C. Watts, Louisville, Ky.)

Becky Coomer, a staffer at WSLM, Salem, Indiana. (Photo by R.C. Watts, Louisville, Ky.)

KEGX ("The Eagle") is formerly KOTY-FM. It plays classic rock in Tri Cities, Washington. (Courtesy S. M. Kesterson Pasco, Wash.)

to the listener had cost listeners and advertisers. The station estimated its losses at $50,000.

The FCC said it was looking over the complaints that had been filed. Some observers pointed out, however, that while FCC regulations trigger problems for broadcasters as the result of certain vulgar or lewd references, the regulations do not prohibit the use of racial or religious slurs or degrading epithets.

We appreciate this information from Phil Starks, KB0FFW, Old Monroe, Mo., who furnished us with some of the clippings from the coverage on this that ran in the *St. Louis Post-Dispatch*.

Very Fine: Houston FM'er KLOL is apparently liable for a forfeiture of $33,750. That's for broadcasting indecent material during a call-in "sex survey" that ran during several mornings in March, 1991.

The FCC said "the language was lewd and vulgar" and was broadcast "at times of day when there was a reasonable risk that children may have been in the audience." A year earlier, the station had been fined $6,000 for the same call-in survey during the same time slot.

Upon the request of the stations involved, the FCC reviewed three forfeitures

The Best*
Just Got Better!

The Eavesdroppers™ now includes our new Zap Trapper™ Electronic Gas Tube Lightning Arrestors. Receive-only design shunts damaging transients to ground at only 1/7th the voltage buildup of the available 200 watt transmit-type arrestors, providing maximum solid state receiver protection.

Protect your investment - combine an excellent shortwave receiving antenna with the best receiver protection money can buy.

- Completely assembled and ready to use
- Only 42' overall length
- 8 trap circuits permit reception on all shortwave bands, 11-90 meters.
- All connections soldered and enclosed in ultrasonically-welded, hermetically-sealed trap covers
- Includes 50' of 450 lb. test nylon rope

Model T includes 100' twinlead feedline
Model C includes weatherproofed center connector for your coax & coax sealant
- Either model $79.95
- UPS for lower 48 states $5.00
- COD add $4.50, IL add 7% sales tax
- Foreign shipping quoted

- *"The best...built like an antenna should be."*–Larry Magne in ***World Radio TV Handbook***
- *"Our best seller."*–EEB in their recent ads and catalogs
- *" Now in use in 45 countries."*–Gilfer Shortwave in 1983

Antenna Supermarket
P.O. Box 563 Palatine, IL 60078 Tel (708) 359-7092 Fax (708) 359-8161
At your dealer or direct • Visa & Mastercard accepted

Changed FM Call Letters

New	Was	
KBEW-FM	KQEI	Blue Earth, MN
KBOC	KWCS	Bridgeport, TX
KCDX	KOYF	San Carlos, AZ
KERX	KCCL-FM	Paris, AR
KIXB	KAYZ	El Dorado, AR
KJTA	KOYG	Flagstaff, AZ
KKMX	KTRQ-FM	Tri City, OR
KMXX	KCBD	Imperial, CA
KRXX-FM	KRXX	Minneapolis, MN
KYJX	KVTY	Mission, TX
KXTJ	KWIC-FM	Beaumont, TX
KYNU	KQDJ-FM	Jamestown, ND
KZLZ	KCDX	Kearny, AZ
KZMS	KAAW	Patterson, CA
WAHC	WTLT	Circleville, OH
WAZZ	WMXF-FM	Laurinburg, NC
WBBS	WKFM	Fulton, NY
WBCS	WCDJ	Boston, MA
WBEB-FM	WEAZ-FM	Philadelphia, PA
WCMF-FM	WCMF	Rochester, NY
WCTU	WFSM	Tazewell, TN
WDKC	WHMU	Covington, PA
WELH	WUFG	Providence, RI
WEZK-FM	WEZK	Knoxville, TN
WGXL	WTSL-FM	Hanover, NH
WHPN	WRTQ	Harrisburg, PA
WJNX	WRRH	Franklin Lakes, NJ
WJYL	WJTE	New Washington, IN
WKOR-FM	WKIR	Columbus, MS
WZKA	WVSV	Stevenson, AL
WMMA	WAAR	Lebanon, OH
WMSU	WKOR-FM	Starksville, MS
WNCN-FM	WNCM	Jacksonville, FL
WNOG-FM	WRGI	Naples, FL
WQBB-FM	WEMQ	Knoxville, TN
WQKK	WIYQ	Ebenburg, PA
WQLW	WIDO	Eutaw, AL
WQQZ	WREI	Quebredillas, PR
WRLD-FM	WUAF	Valley, AL
WRTQ	WJTF	Ocean City, NJ
WSCY	WNHX	Moultonborough, NH
WTIF-FM	WQBX	Omega, GA
WTKS	WWNZ-FM	Cocoa Beach, FL
WUBJ	WKJW	Jamestown, NY
WWBV	WYHA	Beaver Springs, PA
WWDX	WXMX	St. John's, MI
WWFG	WKHI	Ocean City, NJ
WXMX	WKNW-FM	Canaan, VT
WXRG	WQFX-FM	Gulfport, MS
WYIQ	WHRH	Warner Robins, GA
WZIQ	WXAA	Smithville, GA
WZQQ	WRNG	Hyden, KY

of $2,000 each for indecency issued to WXRK, New York, NY; WYSP, Philadelphia, Pa.; and WJFK, Manassas, Va. These fines were for broadcasting Howard Stern's program at times when the agency claims children were likely to be listening.

Upon reviewing its previous issuance of these fines, the FCC said that in its opinion, it's original forfeitures were the right thing. The agency dismissed the appeals for review, saying that the broadcasters had "provided no additional facts." The FCC therefore saw no reason to alter its earlier decision in this matter.

DAB Comes to PRC: The Province of Xinjiang, in the westermost area of the PRC, now has its own digital audio broadcasting (DAB) network. From studios in Urumqi, six mono and one stereo channel are sent out in various languages, such as Kyrguz and Uygur. These are transmitted via AM and FM from 50 different sites.

The network was established this past August by Xinjiang Broadcasting of China and ComStream.

All Quiet On The Western Front: The licensee of AM station KCNY applied for renewal of the station's license. The FCC therefore asked KCNY, of Moab, Utah, to explain why its license needs to be renewed inasmuch as the station has been dark for more than three years without FCC authority. A hearing was designated to learn the answer.

AM station KBZB, Bisbee, Ariz., has been silent since 1988. When the licensee requested that the FCC renew the station's license, the FCC asked for an update on the station's status. As of late May, 1993, KBZB's licensee had not asked for a new authorization to remain silent. The previous authorization had expired in March of 1993. The FCC had told the the licensee that an extension might be granted only if the request were accompanied by a detailed summary of steps taken to return the station to on-air operation. Previously, the licensee had claimed that he was attempting to raise funds to put the station in operation.

At this point, the FCC appears to be having its doubts as to whether KBZB is a good bet to return to the air, and whether its licensee has the capability and intent to make it happen in the foreseeable future.

Therefore, the FCC is holding a hearing as to whether it will renew the license of KBZB.

The FCC reaffirmed its decision not to renew the license of AM station WOKJ, Jackson, Miss. The agency also affirmed its earlier $8,000 forfeiture against the licensee for failing to illuminate WOKJ's towers during periods of darkness for five months. This was a violation of FCC and FAA regulations.

WOKJ used six towers 388-ft, located 2.5 miles from an airport. The FCC contends that correspondence to the licensee relating to the was not answered with candor, and some letters were completely ignored.

The licensee requested that the FCC reconsider its decision, but the FCC said that no new facts were presented, and no circumstances had changed that would have caused them to revise their earlier decision.

'TIS a Problem: You may be familiar with the Travelers Information Stations (TIS) that have been running low power on 1610 kHz for years. Their recorded messages help drivers navigate airport parking lots, highway construction zones, national parks, and similar places. It seems that their continuing presence on 1610 kHz is relevant to the proposed use of this frequency as part of the new 1605 to 1705 kHz extended AM broadcasting band.

The recognizes this problem, but will not evict all of the low power TIS stations from 1610 kHz. The TIS stations, however, will only have access to 1610 kHz on a secondary (non-interference) basis to broadcasters. Existing TIS stations will optionally be permitted to shift to AM frequencies elsewhere in the band, although not channels close to those used by any AM stations in their respective localities.

One proposal is for the TIS service on 1610 kHz to shift to 1710 kHz. This is just in the talking stage at present. The deciding factor may be after they see what happens when the 50 watt (and less) TIS stations and the regular broadcasters mix it up on 1610 kHz, and elsewhere on the AM broadcast band. Could be no problem at all. But it might be a disaster. We'll have to wait and see.

It's the top of the hour and our shift is over. Let's hear from you with news clippings, station format changes, station photos, stickers, and anything else you have relating to AM/FM broadcasting. ■

New FM Call Letters Issued

KABS	Great Falls, MT
KACJ	Boonville, MO
KACK	Layoma, OK
KACP	Custer, SD
KACQ	Lometa, TX
KCGR	Cottage Grove, OR
KDBR	Kalispell, MT
KDMG	Burlington, IA
KEPX	Eagle Pass, TX
KHLL	Richwood, LA
KHMB	Hamburg, AR
KJYL	Eagle Grove, IA
KLMY	Seaside, CA
KLSC	Socorro, NM
KRLI	Malta Bend, MO
KRNC	Reno, NV
KRNW	Chillicothe, MO
KSDJ	Brookings, SD
KSKK	Staples, MN
WAAU	Appleton, WI
WABU	Inglis, FL
WACJ	Bowman, SC
WBBU	Baker, LA
WCCK	Calvert City, KY
WCVM	Bronson, KY
WFSW	Panama City, FL
WFYZ	Ravenswood, WV
WKLW-FM	Paintsville, FL
WLXC	Lexington, SC
WMBU	Forest, MS
WQKO	Howe, IN
WRLM	Whitewater, WI
WTGF	Milton, FL
WYQE	Naguado, FL

MONITOR WITH THE PRO's

- *The World Scanner Report* -

published 10x/yr for casual hobbyists • follows the latest technology of scanning the radio frequency spectrum from DC-to-daylight • consumer & hobby electronics • do-it-yourself scanner/receiver projects. • SASE or 2 IRC for info, or

US Funds: $4/ea; $25/yr; Canada+15%; foreign+25% surf/50% air; MC/VISA ok

COMMtronics Engineering; PO Box 262478; San Diego, CA 92196

CIRCLE 57 ON READER SERVICE CARD

CB RADIO OWNERS!

We specialize in a wide variety of technical information, parts and services for CB radios. 10-Meter and FM conversion kits, repair books, plans, high-performance accessories. Thousands of satisfied customers since 1976! Catalog $2.

CBC INTERNATIONAL
P.O. BOX 31500PC, PHOENIX, AZ 85046

+30db

The Original .... Select-A-Tenna

- AM RADIO ANTENNA WORKS WITH THE BUILT-IN ANTENNA IN YOUR RADIO
- NO WIRES TO CONNECT
- NO BATTERIES
- HIGH-Q SUPER GAIN AND SELECTIVITY
- PROVEN WORLD-WIDE FOR OVER 22 YRS
- SATISFACTION GUARANTEED
- THIS ONE REALLY WORKS!

$49.95 POST PAID

INTENSITRONICS CORP.
P.O. BOX 562 DEPT. Q
HALES CORNERS, WISC. 53130

TOLL-FREE 1-800-382-4155
FAX 1-317-883-7555

MADE IN USA

CIRCLE 67 ON READER SERVICE CARD

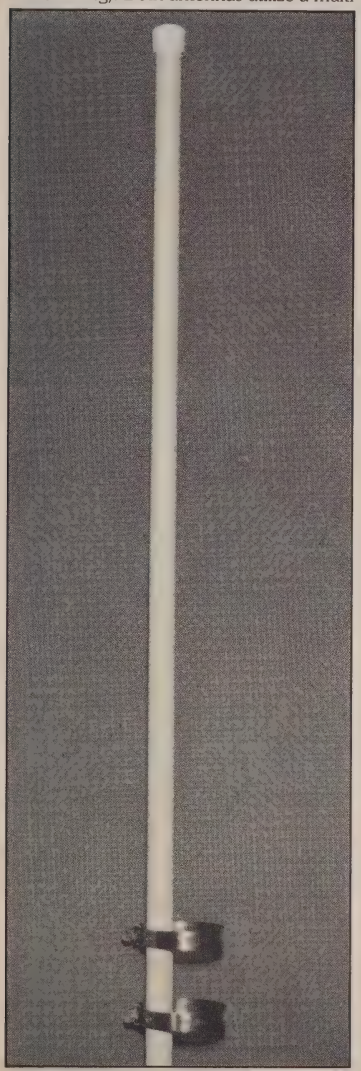
NEW PRODUCTS

REVIEW OF NEW AND INTERESTING PRODUCTS

High Gain 800 MHz Scanner Antenna

Electron Processing, Inc. announced two new additions to their line of scanner antennas. The DANA-1 and SUPER DANA antennas are designed to provide 800–950 MHz reception.

The standard DANA-1 provides 9db of gain and can be used for transmitting as well as receiving. The SUPER DANA contains the same 9db gain antenna as the DANA-1 but has a 15db gain amplifier to make even the weakest signals strong. The SUPER DANA is for receive use *only* (no transmitting). Both antennas utilize a multi section co-linear antenna design and are encased in a rugged CPVC tube. At only 35" long and supplied completely assembled with mounting clamps for masts up to 1.5" diameter, installation is easy.

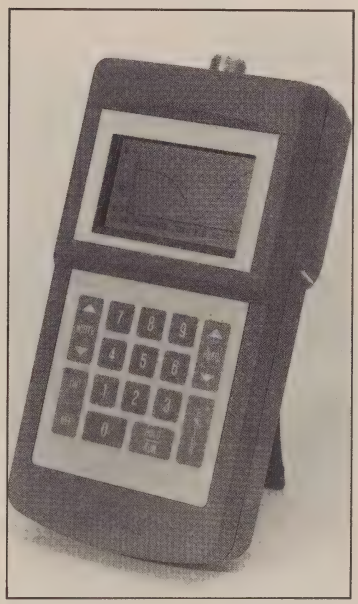


The DANA-1 is priced at $35 while the SUPER DANA is $80. There is a $5 shipping and handling (Canada, AK, HI $8) charge. To order or for additional information, contact Electron Processing, Inc. at (616) 228-7020 or write P.O. Box 68, Cedar, MI 49621.

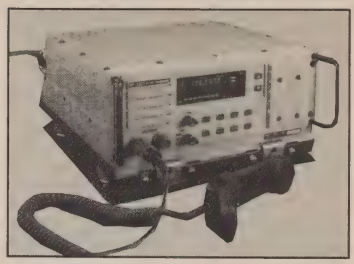
Graphic Antenna Analyst

For antenna enthusiasts, the SWR-121 handheld antenna analyst provides comprehensive antenna performance information in an easy-to-read graphic format.

With its LCD spectrum display, the SWR-121 displays an antenna's SWR cure over an entire frequency range. Other antenna SWR analyzers available only show SWR at one frequency, requiring the user to perform the time consuming task of plotting the curve by hand. This battery-operated unit is designed for portability and ease of use.



The SWR-121 is available from any authorized AEA dealer. For more information and a list of authorized dealers, contact AEA's literature request line at (800) 432-8873, or write Advanced Electronic Applications, Inc., PO Box C2160/2006, 196th St. SW, Lynnwood, WA 98036. Phone (206) 774-5554.



HF/VHF Radios Offer FM Operation On All Bands

New from Harris RF Communications is an advanced 125-watt HF/VHF radio transceiver with full receive and transmit FM operation on all bands.

The RF–3201 HAWK Series covers HF and VHF bands for long- and short-range communications. This includes low-band VHF (30–32 MHz) for interoperability with manpack radios, as well as high-band VHF (146–172 MHz) for communication with VHF handheld radios, police and fire units, marine craft and other local services.

The HAWK Series radios are designed for applications where reliable, high-performance, multi-band communications are demanded in extremely harsh operational environments. The transceiver, along with its companion antenna coupler and accessories, have been constructed for protection from shock, vibration, humidity and extreme temperatures.

An analog voice privacy module is standard in the HAWK radio transceiver, to protect sensitive communications from unauthorized intercept. The HAWK transceiver also incorporates speech processing circuits to provide exceptionally clear voice communications.

The HAWK transceiver provides easy operation and configuration for any combination of continuous tuning and channelized operation. The radio can be programmed to permit operation only on preselected channels. Password controlled multiple security levels inhibit unauthorized reprogramming by field operators.

Internal options available with the RF-3201 include a 5-watt VHF amplifier and a plug-in Automatic Link Establishment (ALE) module. The ALE option is interoperable with MIL-STD-188-141A and FED-STD-1045 systems.

The RF-3201 operates on 12 or 24 VDC. A selectable front-panel power output control is provided for extended operation with battery/solar powered or LPI applications.

For more information, contact Harris Corporation, 1680 University Avenue, Rochester, NY 14610.

SCANNING VHF/UHF

BY CHUCK GYSI, N2DUP

MONITORING THE 30 TO 900 MHz "ACTION" BANDS

In most areas of the country, it isn't going to get too cold quite yet. And that only means you have plenty of time to check out your antenna farm before the long winter kicks in for another season.

Exposed connectors and damaged elements won't help your listening when you need to be tuned in. If there are connectors on the end of your coaxial cable where they attach to your antenna, they should be covered to keep out water and ice. Commercially available seal material is available and wraps around your connector like putty to keep the elements away. Most radio stores stock this item for a few dollars. In the absence of such a sealer,at least try to wrap a good (not cheap) electrical tape around the connector. It won't be as good, but it will help some. By keeping out the elements, you will enhance not only your listening, but also the life of your antenna as you ward off corrosion.

You should also inspect your antennas for damage. Some antennas seem to attract overweight birds and the elements either bend under their weight or break off entirely. Wind also causes stress on antennas and their mounts. Ensure that your antenna is still securely attached to its mast or tower by giving it a little shake. If needed, tighten mounts.

If you have a tower or a ground-up mast for your antenna farm, visually inspect it before the winter and its effects of ice or wind could cause possible damage. Be sure the tower is still tightly bolted between sections and the ground base is in good condition. If guy wires are attached, be sure everything is snug.

If you take these precautions now, your antenna farm should give you lots of listening pleasure even in the cold of winter, not to mention for years to come with the same regular preventative maintenance.

An emergency road service worker provides motorist assistance. Check the automobile emergency radio service frequencies, as well as business band frequencies, for work performed by tow operators and auto clubs.

Tows

John Marlinger of Dover, Delaware, writes to say that he likes to listen to tow trucks, especially during bad weather conditions, but guesses that he hears only about half the tow trucks in his area. He says that he has punched into his scanners all the frequencies allocated to the automobile emergency radio service, but knows there are other tow operators in his area that must have radios but aren't using these frequencies reserved for tow trucks.

First, let's take a look at the frequencies reserved for privately operated tow trucks: 150.815, 150.830, 150.845, 150.860, 150.875, 150.890, 157.470, 157. 485, 157.500 and 157.515. In addition, the following frequencies can be used by auto clubs providing emergency road service for members: 150.905, 150. 920,150.935, 150.950, 150.965, 452. 525, 452.550, 452.575 and 452.600. The four UHF frequencies are simplex only—without repeaters—meaning the base stations and mobiles operate on the same frequency, which is unlike most wide-area UHF radio services. Tow operators also are eligible for automobile emergency frequencies in the 851–866 and 935–940 MHz bands.

However, the place you'll find most tow trucks aren't generally on automobile emergency radio service frequencies. Most use business band frequencies because it's easier for radio shops to set up their customers this way. Because any profit-making enterprise can use business radio service frequencies, tow operators are included in this group. While some tow trucks may take advantage of frequencies in the VHF low band range between 30 and 50 MHz, as well as those frequencies available for businesses in the 151 and 154 MHz ranges, many simply operate on wide-area repeater systems in the 461-465 MHz band. In larger metro areas, you also will find tow trucks using the 470-512 MHz T band, the 851-856 repeater band, the 856-866 MHz trunked band, or the 935-940 MHz trunked band.

A towing firm may require wide-area coverage that a repeater offers, however, the automobile emergency radio service does not allow repeaters on UHF. Because the business radio service does allow repeaters on UHF, that may prove a viable alternative for a tow operator. Also, it may prove cheaper for a tow operator to operate on a community repeater on UHF that is owned by a radio shop and which is rented to various firms that all use the same repeater. It certainly is a lot more expensive for a firm to put its own repeater on the air, so community repeaters with monthly user fees usually prove more palatable to the checkbook. It is the same reason you may see newspapers using community repeaters for news and circulation activities, instead of putting their own repeaters on the air on the two available frequencies at 452.975 and 453.000.

Before closing, it also should be noted that there are a handful of frequencies available to tow operators for low-power (2-watt) operation. These frequencies—452. 5125, 452.5375, 452.5625, 452.5875 and 452.6125—could technically be used for on-scene use, but might be more practically employed for mobile repeater use. For instance, the tow truck driver would carry a UHF handheld while outside his truck and transmit to the truck on UHF while a repeater in the truck retransmits the signal onto the VHF channel with much more power output, allowing the driver to maintain contact with his or her dispatcher while outside the tow truck. As a general rule, these frequencies just aren't used, but don't be surprised to find something pop up!

Mics

Rand Sayler of North Lauderdale, Florida, writes from Italy to tell us about wireless microphone frequencies there. Rand

liked the article Chuck Robertson wrote in POP'COMM in April about wireless mics.

Rand says that he watched a television production company for TeleGiornale 4 (TG4) news using wideband wireless microphone frequencies for low-power operations: 156.620 (mic) and 156.785 (cues). This was an elaborate standup shot of a reporter in front of a court building for a story on corruption.

Rand adds that the wireless mics were independent of the video cameras and that the cue was used for the local director and studio anchor to speak to the reporter.

Outer Space

From Abbotsford, British Columbia in Canada, comes a letter from Timothy Mogden, Registered Monitor, VEM8BC-40. Timothy says that this column is the first spot he stops at when opening his magazine each month. He says that during recent space shuttle flights in the United States he was able to hear shuttle audio and updates on 442.350 and 147.060 locally and wants to know why.

Because many shuttle flights include astronauts who are licensed hams, there is intense interest in the ham community about the shuttle program. On many of the shuttle flights, the astronaut hams have taken the time to operate amateur stations on board the shuttle. While a lot of contacts are scheduled with schools by the astronauts, the flight crews also take time to communicate with earthbound hams in their homes.

Because of this interest in the shuttle program by so many hams, amateurs have gotten permission to retransmit shuttle audio over their own frequencies. This audio feed is generated by NASA and is fed over HF frequencies on shortwave and retransmitted on repeaters all across the land. While some ham clubs may retransmit the shuttle audio for only a few hours at a time, other clubs broadcast the audio for the entire flight.

The next time the shuttle takes off, you may want to check frequencies in the 144–148 and 440–450 MHz ham bands for the NASA audio reports.

Timothy also passes along a few frequencies for his area: 142.965, Matsqui police dispatch; 140.295, Matsqui police Tac 3; 139.350, Abbotsford RCMP dispatch; 149.110, ambulance; 149.440, local dispatch ambulance; and 149. 080, Department of Communication inspectors (equivalent of the Federal Communications Commission in the United States).

Deep In The Heart

Cliff Mullican, Registered Monitor KTX5IN, of Ferris, Texas, sends in his list of Dallas area frequencies:

Dallas police: 460.325, F-1, central and east; 460.375, F-2, northeast; 460. 500, F-3, southeast; 460.425, F-4, southwest and Oak Cliff; 460.075, F-5, northwest; 460.175, F-6, north; 460.275, F-7,traffic; 460.125, F-8, tactical; 460.025, F-9, information; 460.225,F-10, car to car; 460.475, F-11, investigators; 460.400, F-12,secondary/Cotton Bowl.

Dallas fire: 154.415, F-1, secondary; 154.130, F-2, ambulance;153.890, F-3, primary; 154.160, F-4, fireground; 460. 575, dispatch. Dallas County sheriff: 155. 715, F-1 constables; 155.985, F-2, jail security; 155.970, F-8, unit to unit; 155. 670, dispatch.

Ellis County: 155.835, F-1, sheriff; 159.450, F-2, sheriff's deputies only; 46. 46, low band, countywide fire; 154.265, high band, countywide fire.

Cliff says that he's been reading *POP'COMM* for three years. He uses a Realistic Pro-2028, Pro-58 and Pro-31.

Write On

What questions do you have about scanning the VHF and UHF bands? How about sending in a list of your favorite frequencies? And while you are at it, let's see a picture of your listening post, preferably with you seated at the dial.

Write to: Chuck Gysi, N2DUP, Scanning VHF/UHF, Popular Communications, 76 N. Broadway, Hicksville, NY 11801-2909. ■

NOW! A QUALITY SATELLITE SCPC AUDIO RECEIVER

AT AN AFFORDABLE PRICE

UNIVERSAL SCPC-100 AUDIO RECEIVER

SPECIFICATIONS

STABLE, MICROPROCESSOR CONTROLLED TUNING. • 50 CHANNEL MEMORY RECALL. • COMPATIBLE WITH 950-1450 BLOCK SYSTEMS. • 3 MINUTE HOOK-UP. • LARGE L.E.D. TUNING SCALE. • RECEIVES C AND KU BAND SCPC. • DOES NOT DISABLE VIDEO WHEN IN USE.

SERVICES ON SCPC

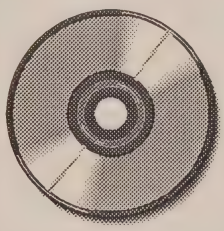
HUNDREDS OF QUALITY SCPC CHANNELS ON SATELLITES - SPORTS - AP - UPI - RADIO NETS - HOME TOWN SPORTS & RADIO - RACING - TALK SHOWS - CLASSICAL, ROCK & JAZZ - RADIO STATIONS - FINANCIAL NEWS AND MORE.

INTRODUCTORY PRICE $439.00 PLUS S & H

UNIVERSAL ELECTRONICS, INC.
4555 GROVES RD., SUITE 13, COLUMBUS, OH 43232
(614) 866-4605 FAX (614) 866-1201

FCC MASTER FREQUENCY DATABASE CDROM

All frequencies within the FCC Master Frequency Database for the entire US on CDROMS



Dbase File Structure (ASCII Avail)

Exporting Available

Frequency, Callsign, DBA Name, Licensee, City, State, Zip

Transmitter Lat & Long, Elevation, Antenna Height Address and County

Radio Service Code, Issue & Expiration Dates and more ....

Custom Databases Available

Full Master Frequency Database Available on CDROM
Single Subset/US and Single State/All Subsets also available
Call for more information and pricing on our complete product line.

PerCon Corporation
CD Applications Division
4906 Maple Springs / Ellery Road
Bemus Point, NY 14712

(716) 386-6015 (716) 386-6013 FAX

MasterCard DISCOVER VISA

The Satellite Station You Already Own

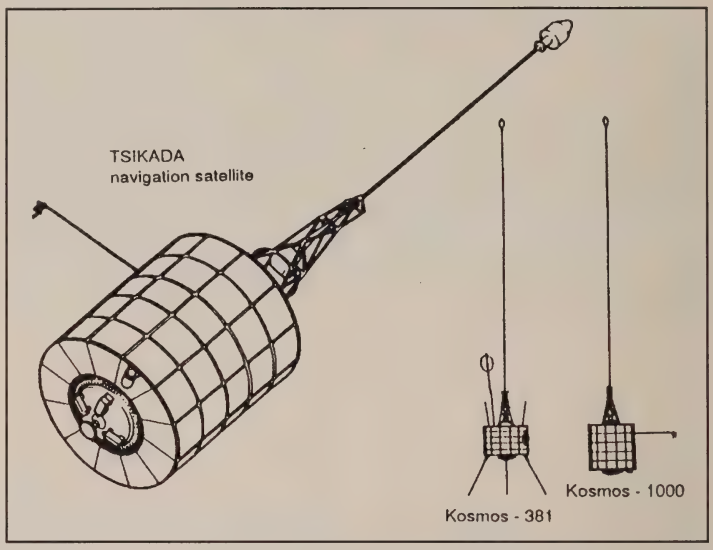
Contrary to popular opinion, it does not take extraordinary technical expertise, sophisticated equipment or large investments of capital to begin Amateur Radio satellite operations. In fact, you may already own all the equipment you will need. In 1979 your commerades in the USSR, Russia, CIS or whatever else the new commonwealth wants to be called, began launching a fleet of low altitude satellites designed for QRP operation. The frequency bands they use will surprise you even more.

If you are like most Amateurs, your major obstacle to satellite operation is the self-imposed psychological barrier. It is similar to the barrier some of us experienced when we first approached CW before becoming licensed Amateurs. The best way to overcome this barrier is through knowledge and experience. Reading about satellite operations will move you in that direction.

Soviet satellites are known as Phase II type. Early Phase II satellites carried a single transponder with a 2–meter uplink and a 10-meter downlink. They still use a low altitude Polar orbit. This means the satellite travels near the poles during each orbit.

There are currently three Soviet satellites in orbit. RS-10/11, RS 12/13 and RS-14. RS stands for Radio Sputnik (some in America call them Radio Sport). The unique feature about these spacecrafts are the transponders they carry. A transponder for you beginners is simply the satellite equivalent of a repeater. The difference being that the transponder only operates SSB and CW (data on RS-14). A transponder also differs in that it uses two separate frequency bands not just a different frequency in the same band. What is called an A-mode transponder has been an all U.S. and Soviet Phase II satellites. This is a 2–meter uplink and a 10–meter downlink. The unique feature of the latest satellites from the USSR is that they also use 15 meters for an uplink and several band combinations which can be seen in the attached frequency list. So if you have a separate HF transmitter and receiver or a transceiver and a separate receiver (like a portable Sony shortwave receiver) you are already equipped for satellite operation and didn't even know it.

These frequency combinations can provide some exotic DX possibilites. For example, I talked to a New Foundland mobile on 10-meters SSB through a Soviet satellite. My signal was uplinked on 2-meters and downlinked on 10. I did have some trouble explaining to him I was talking to him through a satellite. Hams in England have also talked to New Zealand via the 15/10 meter transponders. And talk about satellites on a shoe string. I know amateurs who have built a QRP 2–meter CW transmitter and use a shortwave receiver for downlink on 10-meters. You can't get much simpler than that. Your antennas can be just as simple. My first antenna was a homemade 2-meter J-pole for uplink and a G5RV for downlink.



The TSIKADA satellites carry the RS-10/11 and RS-12/13 amateur transponders.

The satellites can be heard on 10 meters between 29.360 and 29.400 MHz for RS-10/11, 29.400 to 29.450 for RS-12/13. You won't need exotic coax and connectors, pre-amps, rotors, twist antennas, RF amps or that second mortgage to begin satellite operation.

Your first task will be to listen to the CW beacons on the satellites. These frequencies are listed below and are found on every band the satellite operates on. Finding the beacon and listening to the signal will show you what to expect in the way of signal strength, frequency shift, fading, length of each pass. You will notice what is called doppler shift. This is a slow drift in frequency caused by the motion of the spacecraft. The beacon frequency will appear higher by +3 kHz, as it approaches your location and lower after it has passed overhead. There will also be some deep fades noticed. This is due to the fact that the satellites spin for both stablilization and temperature control. When the spacecrafts antenna is at a right angle or a different polarity from your antenna, you will have a fade. This is something you will get used to or you can, though it is not necessary, use pre-amps or a twist antenna. With the current 8 watts of RF output (which is high by amateur satellite standards) the satellites downlink signal strength is good.

The CW beacon will be transmitting the condition of the spacecraft in a coded sequence of letters and numbers. With the attached formulas you can decode the transmissions and find out some interesting information about the spacecraft. Like the temperature of the satellite, number of QSO in memory, voltages, etc. The beacon transmits at 20 wpm.

After you have found the satellite's CW beacon you can next look for phone (SSB) traffic just below the frequency of the beacon. SSB is usually clustered near the high end on the transponder. The CW is usually found in the lower portion (which is also lower in frequency). Each satellite will be in

range of your location for approximately 15 to 20 minutes during each pass. If you tune in the satellite on the first pass that it is within range you will generally have the next two consecutive passes during which you will hear it. It takes the spacecraft 105 minutes to complete one orbit of Earth. This will give you an idea when to listen for the next pass. So start monitoring those beacon frequencies.

You will, of course, want to start tracking the satellite. These days satellite tracking is usually done by computer. But again this is not necessary. You will however want to get good orbital information on orbital pass so you can calculate approximate times and plan your operating times accordingly. If you want to use a computer write Amsat software exchange or NASA (see both addresses below). NASA can even supply you with weekly orbital information on any satellite you want to track, amateur, military or commercial. Another source of information is the weekly AMSAT radio nets. I have also attached a schedule for these meetings. They allow you plenty of opportunity to learn about and ask questions about satellite operation.

As these satellites are designed for QRP operation you will find them easy to hear and easy to access once you decide to do so. The transponder is designed for a maximum uplink power of 10 watts. In fact, Soviet Amateur stations are limited to 10 watts RF. So they are quite sensitive and easy to overdrive. When this happens the satellite can simply shut itself off to protect itself from people (like Americans) who insist on using high power. All RS spacecraft have a 10db attenuator pad which is dropped in line when over the U.S. It would seem that our reputation preceeds us. This abuse can shorten the life of the satellite and lessen our enjoyment of it. I have had more than one European QSO killed by a thoughtless operator in Michigan. So keep the power level low.

If you use a beam antenna for uplink, you will notice there are times when even low power overdrives the satellite. Simply track a little ahead of or behind the satellite. Keep your antenna slightly off the satellite. A unity gain vertical can also be used. In fact you will want to begin operation like this as tracking with an antenna takes some practice. Your first task will be to gain access and track your own signal through the transponder. Begin by sending a series of v's or your favorite letter in CW. Once you have found your signal, begin sending CQ or switch to SSB. As your signal drifts off the center frequency of your receiver, your first temptation will be to touch up the receiver. Don't do it! Touch up the transmit VFO instead, bringing your signal back to center frequency on your receiver. This will keep you from drifting through someone else's QSO.

Each RS satellite carries a ROBOT. This is an automated computer mode that allows you to talk directly with the spacecraft. This is done, of course, in a pre-arranged protocol and in CW only. On the Robot frequencies you will find the satellite calling CQ near 20 wpm. It will tell you what frequency to call it on. You then simply call the thing like you would any other station. "RS-10 de N9CUE K." If your wrist is good enough and your speed is up, it will call you, give you a signal report and a QSO number and bid you 73's. If not, it will tell you what you are doing wrong. For example, if you were sending too slow or that you were QRMed, etc. If you send your QSO number off in a letter to Moscow Radio Club, Box 88, Moscow, Rusia, CIS you will receive an attractive QSL card.

Current RS satellites allow you radio coverage of the Northern Hemisphere and Central America (and the Islands) when it is over the U.S. With the 15 to 10 meter transponders, the range increases consid-

TELEMETRY DELINEATED

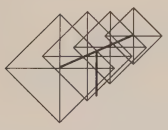
CHANNEL NUMBER		
1	IIS IID IIR IIG	TLM data source sampling period 90 minutes
	IIU IIK IIW IIO	.....10 minutes
		Power supply voltage over sample period
		where V=n/4 volts
2	INS IND INR ING	2 meter receiver with -20dB attenuator in
	INU INK INW INO	.....0 dB attenuator in
		n/10=V (in watts)- output power of 2 m transmitter
3	IAS IAD IAR IAG	15 meter receiver with -10dB attenuator in
	IAU IAK IAW IAO	.....0 dB attenuator in
		n/10=V (in watts)- output power of 10 m transmitter
4	IMS IMD IMR IMG	15 meter uplink off
	IMU IMK IMW IMO	15 meter uplink on
		n/5=V (in volts)-15 meter receiver AGS voltage
5	NIS NID NIR NIG	2 meter receiver off
	NIU NIK NIW NIO	2 meter receiver on
		n/5=V (in volts)-2 meter receiver AGS voltage
6	NMS NMD NMR NMG	Special command station channel off
	NMU NMK NMW NMO	Special command station channel on
		n/5=V (in volts) - Special command station AGS voltage
7	NAS NAD NAR NAG	Output power of 10 meter beacon 1 is Max
	NAU NAK NAW NAO	..... Min
		n/3 - Service command parameter
8	NMS NMD NMR NMG	Output power of 10 meter beacon 2 is Max
	NMU NMK NMW NMO	.....Min
		n/3 - Service command parameter

The telemetry is sent in CW. It represents various status indicators and measurements made on the transponders. There are 16 channels sent. Each is three alpha characters. For example, in "IMS45," "IMS" is the alpha and "45" is the numeric of the channel. The alpha gives each feature a specific status such as "on" or "off." In "IMS45," "IMS" gives a specific status for channel 4. 21MHz receiver status "IMS" means the 21 MHz receive is off. If, however, "IMS" is replaced by "IMU" in channel 4 as in "IMU45," then the 21 MHz receiver is activated. The numeric part of channel 4, "45" in our example, gives the AGS level on the 15 meter receiver where the value in volts equals the number sent divided by 5. That is, volts=n/5 or 45/5=9 volts.

SE SIGNAL ENGINEERING'S
High Performance CB Antennas

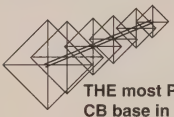
SUPERHAWK
$114.95

Goldenrod
45 Mobile
Antenna



SPYDER A
$35.95

WHITE LIGHTNING
$199.95



LIGHTNING 6
$359.95

THE most POWERFUL
CB base in the world today!

ALL SE PATENTED rotary beams are true quads and OUTPERFORM their counter parts (quad/yagi types). SE's patented SFS matching system makes SE QUADS the most technologically advanced antennas in the world today.
If your dealer doesn't have SIGNAL ENGINEERING, write or call for full specs. DEALER inquiries invited.

SIGNAL ENGINEERING
2624 Fayette Drive, Mountain View, CA 94040
(415) 948-3833

YOU
AIN'T HEARD
NOTHIN' . . . YET

Since 1967, CRB Research has been the world's leading publisher and supplier of unique hobby and professional books and information including:

- Scanner Frequency Guides
- Shortwave Frequency Guides
- Military/Federal Communications
- Broadcast Station Registries
- Undercover Communications
- Survival Communications
- Covert Operations
- Electronic Espionage
- Surveilance
- Monitoring
- Cryptography & Codes
- Bugging
- Wiretapping
- Communications Antennas
- Computer Technology!
- & Other Related Topics!

Ask for Big Free Catalog

Business Hours: 9 am to 3 pm Eastern (Mon., Tues., Thurs.,Fri.). Closed Wed., and Holidays.

CRB RESEARCH
P.O. Box 56
Commack, NY 11725
Phone: (516) 543-9169/FAX: (516) 543-7486

CIRCLE 11 ON READER SERVICE CARD

RS-12/13 ORBIT CONFIGURATION

Polar circular orbit with average height 1000 km (621 miles), inclination 83 degrees and period 105 minutes.

FREQUENCY GUIDES

	RS 12	RS 13
Mode A Uplink	145.910 - 145.950	145.960 - 146.000
Downlink	29.410 - 29.450	29.460 - 29.500
Mode K Uplink	21.210 - 21.250	21.260 - 21.300
Downlink	29.410 - 29.450	29.460 - 29.500
Mode T Uplink	21.210 - 21.250	21.260 - 21.300
Downlink	145.910 - 145.950	145.960 - 146.000
Mode KA Uplinks	21.210 - 21.250	21.260 - 21.300
	145.910 - 145.950	145.960 - 146.000
Downlink	29.410 - 29.450	29.460 - 29.500
Mode KT Uplink	21.210 - 21.250	21.260 - 21.300
Downlinks	29.410 - 29.450	29.460 - 29.500
	145.910 - 145.950	145.960 - 146.000
Beacons	29.408 29.454	29.458 29.504
	145.912 145.959	145.862 145.908

AUTOANSWER ROBOT

Modes	A; K; T; KA; KT	A; K; T; KA; KT
Uplink	21.129 and/or 145.831	21.138 and/or 145.840
Downlink	29.454 and/or 145.958	29.504 and/or 145.908

TECHNICAL DATA

DC POWER		
All system OFF	4.6 W	3.5 W
All system ON (max)	35 W	25 W
RF output power		
Beacon and Robot (1/h)	0.45/1.2 W	0.45/1.2 W
Transponder TX (29 or 145)	about 8 W	about 8 W

RS-12/13 orbit configuration.

erably. The older RS-3 through RS-8, which are no longer operational, gave U.S. Amateurs a good window into Central Europe on the 2/10 meter bands. This A-mode window will again be possible with the launch of the next RS satellite. I will call it RS-15 for now. It is due to be launched by mid-94. It will have the same frequency band combinations used on RS-10 through 13. It may have a couple of UHF experimental transponders as well. The best news about this satellite is that it will be in a considerable higher orbit (in the range of 1,000 miles, RS 10/11 is at 625 miles) and a lower inclination near 65° (RS 10/11 is at 83°). Don't forget, you read it HERE first.

One final note: you satellite operators who are equipped for the Packet satellites will be pleased to know the Soviets have a data satellite in orbit. Full operational de-

Satellite	Mode	Uplink	Downlink
RS-10	A	145.860 - 145.900	29.360 - 29.400
	T	21.160 - 21.200	145.860 - 145.900
	K	21.160 - 21.200	29.360 - 29.400
	K/A	21.160 - 21.200	29.360 - 29.400
		145.860 - 145.860	
	K/T	21.160 - 21.200	29.360 - 29.400 & 145.860 - 145.900
	ROBOT	21.120 &/or 145.820	29.403
	BEACONS		29.357, 29.403, 145.857, 145.903
RS - 11	A	145.910 - 145.950	29.410 - 29.450
	T	21.210 - 21.250	145.910 - 145.950
	K	21.210 - 21.250	29.410 - 29.450
	K/A	21.210 - 21.250 & 145.910 - 145.950	29.410 - 21.450
	K/T	21.210 - 21.250	29.410 - 29.450 & 145.910 - 145.950
	ROBOT	21.130 &/or 145.830	29.453
	BEACONS		29.407, 29.453, 145.907, 145.953

RS-10/11 modes, uplinks and downlinks.

tails on RS-14 have been included.

RS-14 (AO-21) is the latest offering from Russia. It carries two J-mode transponders (435 uplink and 145 downlink). These standard transponders operates SSB/CW only. RS-14 also carries a RUDAX (Packet) transponder which operate several modes at various baud rates. There are four uplink channels in the 435 MHz band. The downlink can be switched to operate in any of the uplink variations or modes.

This spacecraft is unique in another way. Its main beacon downlink has been used to broadcast messages about world peace. These broadcasts are made with the aid of FM voice synthesizer. These messages are the result of cooperation between Russian Brazilian Amateur Radio communities. Dr. Junior De Castro of BRAMSAT (Amsat Brazil) was the moving force behind the DOVE satellite. It was designed to carry voice synthesized messages of world peace and the peaceful use of space. This task has now been taken over by the RS-14 beacon.

This satellite also uses the 145.983 MHz downlink in conjunction with a 435.016 MHz uplink to provide the first standard FM voice transponder ever used on an Amateur satellite. It is a single channel and is on for a limited amount of time during each orbit. All you need for this satellite is a 2-meter and 70 cm FM rig. Simple vertical antennas will work fine.

Now that you know space communications is much simpler and inexpensive than you first thought, you have no excuse for not jumping in and getting your feet wet. You will find, as I did, that rare tingle of excitement as you make your first satellite contact. Go ahead, take that first step into the final frontier. See you next month ■

RS-14
AMSAT-DL/AMSAT-U Joint Project

Linear Transponder 1:

Uplink:	435.102 - 435.022 MHz (80 kHz)		
Downlink:	145.852 - 145.932 MHz (Inverted)		
Output power:	10 watts maximum.		
Beacon CW telemetry (8 parameters):		145.822 MHz	0.2 watts
Beacon digital telemetry (30 parameters):		1200 bps PSK	
R+Scrambler	2 kHz deviation:	145.952 MHz	0.4 watts

Linear Transponder 2:

Uplink:	435.123 - 435.043 MHz (80 kHz)		
Downlink:	145.866 - 145.946 MHz (inverted)		
Output power:	10 watts maximum		
Beacon CW telemetry (8 parameters):		145.948 MHz	0.2 watts
Beacon digital telemetry (30 parameters):		1200 bps PSK	
R+Scrambler 2 kHz deviation		145.838 MHz	0.4 watts
Beacon digital telemetry (30 parameters):		1100 bps PSK	
R+Scrambler 2 kHz deviation		145.800 MHz	2 watts

Regenerative Transponder RUDAK 2:

Two onboard computers with IPS operating system for packet radio (AX.25) (Mailbox, telecommunications experiment with digital signal processing up to nearly 20 kHz, etc.) 1 MegaByte RAM disk. Four separate uplink channels.

UPLINK:

SAT-RX-1:	435.016 MHz +-10 kHz	1200 bps, FSK, NRZIC/Biphase-M (JAS, PACSAT)
SAT-RX-2:	435.155 MHz +-10 kHz	(AFC) 2400 bps, BPSK, Biphase- S
SAT-RX-3a:	435.193 MHz +-10 kHz	(AFC) 4800 bps, RSM, NRZIC/Biphase-M
SAT-RX-3b:	435.193 MHz +-10 kHz	(AFC) 9600 bps, RSM, NRZI (NRZ-S)+Scrambler
SAT-RX-4:	435.041 MHz +-10 kHz	(digital AFC) RX for RTX-DSP experiments

Output signals of RX-4 are the in-phase and Quadrature components, I(t) and Q(t), which are sent to the DSP RTX immediately after analog/digital convertion with 8 bit resolution. This supports various modulation modes depending on the software. All other receivers provide data (D) and clock (C) at their outputs.

DOWNLINK:
The downlink can be switched to the following operating modes:
Transmit frequency: 145.983 MHz
Output Power: 2 watts nominal (10 watts maximum)

Mode 1:	1200 bps, BPSK, NRZI (NRZ-S) (like FO-20)
Mode 2:	400 bps, BPSK, Biphase-S (AMSAT mode for OSCAR-13 beacon)
Mode 3:	2400 bps, BPSK, Biphase-S (planned for OSCAR-13)
Mode 4:	4800 bps, RSM, NRZIC (Biphase-M) (like 4800 bps uplink)
Mode 5:	9600 bps, RSM, NRZI (NRZ-S) + Scrambler (like 9600 bps uplink)
Mode 6:	CW keying (only for special events)
Mode 7:	FSK (F1 or F2B), e.g. RTTY, STTV, FAX, etc (only for special events)
Mode 8:	FM modulated by D/A signals from DSP-RISC processor (e.g. speech)

RS-14 AMSAT-DL/AMSAT-U joint project.

Use Your Free Reader Service Card For More Information On Companies Advertising In This Issue.

SALE! **Tone-Master™**

Touch Tone Decoder

MoTron Electronics
310 Garfield St., Suite 4
Eugene OR 97402

$60 Off!

Decode and display Touch-Tones from a telephone, tape recorder, scanner, or nearly any audio source. √16 digit LCD display, 80 digit scrollable buffer √ Built-in speaker √ 9V battery √ Metal case √TM- 16 PLUS includes RS-232 output and Software for optional automatic date/time/number logging using your IBM Compatible computer

TM-16 Standard Model $169 ~~$220~~
TM-16 PLUS RS-232 Model with Software ~~$290~~
PS-12 AC Power Adaptor $10 $239

S/H $5 USA/Canada, $15 Foreign.

30 day money back guarantee!Try at no risk!
Visa, MasterCard & American Express Accepted
(Touch-Tone® is a registered trademark of AT&T)

Orders: (800) 338-9058 • Info: (503) 687-2118 • Fax: (503) 687-2492

YOU SHOULD KNOW

BY HARRY HELMS, AA6FW

INTERESTING THOUGHTS AND IDEAS FOR ENJOYING THE HOBBY

Is It Vertical? Horizontal? Does It Matter?

Just how should you install a receiving antenna—in a horizontal or vertical position? There's a lot of confusing and sometimes contradictory advice and "information" out there. Some SWLs swear that antennas work best for DX when they're mounted vertically. Yet a lot of hams who work DX use horizontally mounted antennas like Yagis and dipoles. Some SWLs claim their DX reception really improved when they switched from a vertical antenna to a horizontal antenna, while other SWLs say they got better reception when they traded their horizontal antenna for a vertical one.

So who's right and who's wrong? What's better, a horizontal antenna or a vertical antenna?

Well, it definitely depends.

It All Starts With Polarization

The position of the antenna—whether horizontal or vertical—is called its *polarization*. And polarization of an antenna is important because radio waves are also polarized. Take a look at Figure 1. A radio wave consists of interlinked electrical and magnetic force fields, and these two fields are located at right angles to each other. The position of the electrical field determines the polarization of the radio wave. For example, if a radio wave is traveling so that its electric field is parallel to the Earth's surface, the wave is said to be "horizontally polarized."

So what determines whether a radio wave is horizontally or vertically polarized? The answer is the transmitting antenna! A radio wave from a vertical antenna will be vertically polarized; and a radio wave from a horizontal antenna will be horizontally polarized.

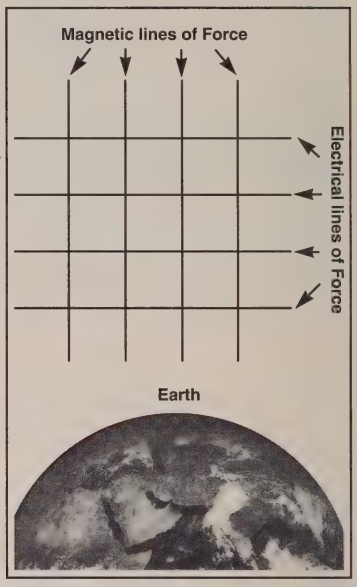
However, a lot of things can change the polarization of a radio wave once it leaves the antenna. Anything that reflects or refracts the signal, such as the ionosphere or the ground, will alter the original polarization of a radio signal. The polarization of a radio wave arriving at your location via ionospheric propagation is a scrambled mess of constantly changing horizontal and vertical polarization. Such a signal is said to be *cross-polarized*.

The polarization of a radio signal can have a big impact on how well you receive higher frequency radio signals. You may be familiar with the concept of "polarized light" and "polarized sunglasses." When you turn the lens of polarized sunglasses, you'll notice that the amount of light that passes through the lens varies greatly. This is because the lens polarization compared to light will change as you rotate the lens. Light and radio waves are both forms of electromagnetic energy and behave the same way. An antenna can best receive a radio wave when it has the same polarization as the radio wave. If the antenna has different polarization, then the antenna is "blind" to the radio wave.

This effect increases with frequency. At frequencies below 30 MHz, it's generally not significant enough to be noticeable. Above 30 MHz, it becomes increasingly important as the frequency rises. Once you get into the microwave range, an antenna will not be able to "see" a signal of opposite polarization. On the 2-meter ham radio band (144 to 148 MHz), trying to use a horizontal antenna to communicate with another station using a vertical antenna will make a difference of several S-units in signal strength. To overcome this, some antennas for over 30 MHz transmit (and receive) horizontal and vertically polarized ways simultaneously. This is known as *circular polarization,* and it's used by several FM broadcast stations and land mobile radio systems where handheld units are an important part. Circular polarization sounds terrific, so why isn't that the standard for above 30 MHz? Well, you don't get something for nothing in radio, and the trade-off you make with circular polarization is a *loss* in the strength of the transmitted signal compared to a vertically or horizontally signal of the same transmitter power. Moreover, circularly polarized antennas aren't very practical for most portable and mobile operations. As a result, vertical polarization rules above 30 MHz.

Ya Gotta Be Tuned

But the polarization of an antenna only has importance if it is a tuned resonant type, like a dipole, quarter-wavelength vertical, Yagi, Quad, etc. If you are using an untuned random length of wire or an active antenna, then it really doesn't matter whether you install it vertically or horizontally. All antennas will exhibit some polarization and directivity characteristics even if they're not tuned resonant types, but predicting these in advance is impossible unless you're an engineering whiz with a lab full of test and measurement gear. So don't think you're getting advantages (or disadvantages) of a certain polarization just because you run a random length of untuned wire in a vertical or horizontal direction. And don't get too concerned about whether an active antenna is installed vertically, horizontally, or somewhere between those two positions.



So Why Are Verticals Better DX Antennas?

A lot of people swear by their vertical antennas for DX work, especially if unable to erect some sort of beam or other directional antennas. I've used a vertical for my ham radio operating for several years and have been very pleased with the results; I managed to earn such awards as DXCC and WPX in two years while running only 70 watts of power.

Verticals (remember, we're talking about tuned quarter-wavelength types here) work because they exhibit a *low angle of radiation*. That's engineering talk meaning that verticals transmit signals that have a narrow angle relative to the Earth's surface. Such signals travel further away from the transmitter site before reaching the Earth's ionosphere and being refracted back to Earth. On receive, verticals are most sen-

sitive to signals arriving just above the horizon as seen from your location. Such signals are typically the most distant ones you can receive. As a result, you might find a vertical to be a less effective performer than a horizontal half-wavelength dipole for less distant communications (such as within 200 miles on 75 meters or within 500 miles on 40 meters) but the vertical will deliver better results on more distant signals.

Now keep in mind this improved DX performance for verticals is a consequence of their low angle of radiation, not the polarization of the signals they transmit. Since the signals will become cross-polarized, as they are refracted off the ionosphere, the polarization of a vertical antenna below 30 MHz is almost irrelevant.

Going Against The Crowd

If you're interested in monitoring the world above 30 MHz, it would seem your antenna choice is simple: just install a vertical and start listening. That's true if you're just interested in hearing local communications, but it is not necessarily so if you're after DX.

Here's why. A horizontal antenna will reduce the strength of local signals significantly, even on the VHF Low (30 to 50 MHz) band. However, DX propagation via the F-layer of the ionosphere or sporadic-E will generally not be as effected since such signals will be cross-polarized anyway. Thus, a horizontal antenna for 30 to 50 MHz can be a handy DX tool, letting you reduce QRM from local stations and sometimes even catch skip DX on the same channels where you have local and semi-local stations. This same trick also applies to TV DX on channels 2 through 6 and the FM broadcast band. Some DXers for those frequencies even have two sets of antennas—one horizontal, the other vertical—for those frequencies.

Even though the effects of polarization are less pronounced below 30 MHz, separate vertical and horizontal (dipoles, etc.) antennas are useful DX tools if you have the room for them. Although the skywave cross-polarization is normally constantly changing, sometimes a signal will be received that is more "horizontal" than "vertical" (or vice-versa). Being able to switch between antennas can make a big difference in some cases in how well you can receive a given station. If nothing else, two different antennas will have different receiving patterns, and that can make a big difference in many situations.

So unless you're using a tuned resonant antenna above 30 MHz, polarization usually isn't too crucial. But the more antennas of different polarization you can't get into the air the better! ■

18th Annual Va. Beach HamFest / Computer Fair™ and Popular Communications SWL Convention

ARRL Virginia State Convention

Oct. 2 & 3, 1993
Va. Beach, VA

- Major Commercial Exhibitors & Dealers
- Amateur Exams & Upgrades
- Special Guests - *Gordon West, WBNOA and Roy Neal, K6DUE*
- DX Forums - Technical Forums
- Major Computer Dealers
- Excellent Food Service
- Held at the ***Va. Beach Pavilion***
- Plenty of FREE Parking
- It's still Vacation Time at the Beach!
- Lots of Nearby restaurants, museums, historic sites - Williamsburg, Busch Gardens, Norfolk Naval Base & more!

General Admission -
$5 Advance - $6 At The Door
Tickets Good for Both Days!

Send SASE -Checks Payable to TRC, Inc.

Tickets & General Info
Manny Steiner, K4DOR
3512 Olympia Lane
Va. Beach, VA 23452
(804) 340-6105

Exhibitor info
Lewis Steingold, W4BLO
1008 Crabbers Cove Lane
Va. Beach, VA 23452
(804) 486-3800

CIRCLE 89 ON READER SERVICE CARD

THE FUTURE OF AMATEUR COMMUNICATIONS

Once in a lifetime, a transceiver is introduced that's so extraordinary and innovative that it opens a totally new era in HF communications. ICOM's pacesetting IC-781 proudly exhibits that hallmark achievement with futuristic designs and features of true legendary proportions. Whether DX'ing, contesting, pioneering new interests or enjoying unquestionable top-of-the-line performance, the IC-781 is indeed today's standard of excellence!

Multi-Function Five Inch CRT. Displays frequencies, modes, memory contents, operating notes, RIT, two menu screens, plus a panoramic view of all signals in a selected range. A portion of the screen also serves as a display for data modes like RTTY, AMTOR, and PACKET.

Dual Width Noise Blanker includes MCF filter plus **level and width controls** to eliminate pulse and woodpecker noise with minimum adjacent-signal interference.

Unique Spectrum Scope. Continuously indicates all signal activities and DX pileups with your operating frequency in the center. Selectable horizontal frequency spans of 50, 100, and 200KHz for each side of the frequency you're listening to. Vertical range indicates relative signal strengths. A contester's dream!

Incomparable Filter Flexibility. Independent selection of wide and narrow SSB filters plus CW filters. Second and third CW IF filters are independently selectable!

Dual Watch. Simultaneously **receives two frequencies in the same band!** Balance control adjusts VFO A/B receive strength levels. You can check additional band activity, even tune in your next contact, while in QSO without missing a single word!

DX Rated! 150 watts of exceptionally clean RF output. Easily drives big amplifiers to maximum power.

Twin Passband Tuning with **separate controls for second and third IF stages!** Increases selectivity and narrows bandwidth, independently varies low and high frequency response, or functions as IF shift.

A Total Communications System! Includes built-in 100% duty AC supply, high speed automatic antenna tuner, iambic keyer, semi-automatic or full QSK CW break-in to 60 wpm, Audio Peaking Filter (APF), RF speech processor, multiscanning, 105dB dynamic range, all-band/all-mode receiver with general coverage, and much more!

ICOM Dependability. The phenomenal IC-781 is built for action and backed with the most extensive warranty in the industry.

See the IC-781 at your local ICOM dealer.

ICOM
First in Communications

ICOM America, Inc., 2380 116th Avenue N.E., Bellevue, WA 98004
Customer Service Hotline (206) 454-7619
3150 Premier Drive, Suite 126, Irving, TX 75063
1777 Phoenix Parkway, Suite 201, Atlanta, GA 30349
ICOM CANADA, A Division of ICOM America, Inc.,
3071 - #5 Road, Unit 9, Richmond, B.C. V6X 2T4
All stated specifications subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. 781188.

CIRCLE 66 ON READER SERVICE CARD

POP'COMM'S World Band Tuning Tips

October—1993

Freq.	Station/Country	UTC	Notes
2325	VL8T, Australia	1100	
3200	TWR, Swaziland	0355	s/on
3215	R. Oranje, South Africa	0300	EE/Afk
3220	HCJB, Ecuador	0400	SS
3250	R. Luz y Vida, Honduras	0200	
3255	BBC Lesotho Relay	0300	
3270	Namibian Bc Corporation	0300	
3280	LV del Napo, Ecuador	0305	SS, close
3290	R. Central, Papua New Guinea	0930	
3300	R. Cultural, Guatemala	0200	
3316	SLBS, Sierra Leone	0600	
3320	R. Suid Afrika, S. Africa	0400	
3330	CHU, Canada	0300	time sigs
3356	R. Botswana	0300	
3365	R. Rebelde, Cuba	0300	SS
3365	R. Cultura Araquara, Brazil	0130	PP
3384	Icelandic State Broadcasting Serv.	0330	Icelandic
3395	Channel Africa, S. Africa	0400	
3810	HI2IOA time station, Ecuador	0200	SS
3985	Swiss Radio Int'l	0500	
4000	R. Cameroon, Bafoussam	0430	FF
4470	Voice of the Mojahed (clandestine)	0300	
4474	R. Movima, Bolivia	0000	SS
4485	R. Tikhiy Okean, Russia	1200	RR
4552	Rdf. Tropico, Bolivia	1000	SS
4649	R. Santa Ana, Bolivia	0030	SS
4755	Educadora Rural, Brazil	0230	PP
4760	R. Frontera, Venezuela	0130	SS
4765	RTVC, Congo	0355	s/on, FF
4770	R. Nigeria, Kaduna	0500	
4770	R. Centinela del Sur, Ecuador	1030	SS
4783	RTV do Mali	0500	FF
4800	R. Lesotho	0330	
4805	Rdf. Amazonas, Brazil	1000	PP
4820	LV Evangelica, Honduras	0200	SS
4830	R. Tachira, Venezuela	0200	SS
4845	ORTM, Mauritania	0630	FF
4850	Cameroon Radio TV	0500	
4855	R. Aruana, Brazil	0000	PP
4865	La Voz del Cinaruco, Colombia	0200	SS
4870	ORTB, Benin	0500	FF
4875	Super R. Roraima, Brazil	0000	PP
4895	LV del Rio Aruca, Colombia	0200	SS
4904.5	R. Nat. Tchadienne, Chad	0430	FF
4915	R. Cora, Peru	1030	SS
4915	GBC, Ghana	0600	
4920	ABC, Australia	1100	
4935	R. Tropical, Peru	1000	SS
4940	R. Ukraine	0500	Ukrainian
4960	R. Cima Cien, Dominican Rep.	0600	SS
4970	R. Rumbos, Venezuela	0200	SS
4975	R. Tupi, Brazil	0800	PP
4985	R. Brazil Central	0100	PP
4990v	R. Apinte, Surinam	0330	
5010	R. Garoua, Cameroon	0600	FF
5015	R. Brazil Tropical, Brazil	0700	PP
5020	Solomon Is. Bc. Corp.	0730	
5025	R. Rebelde, Cuba	0100	SS
5030	R. Continente, Venezuela	0330	SS
5035	R. Aparecida, Brazil	0200	PP
5047	RTV Togolaise	0524	s/on, FF
5050	La Voz del Yopal, Colombia	0200	
5055	TIFC, Costa Rica	0300	
5075	Caracol Bogota, Colombia	0400	SS
5850	WCSN, USA	0600	
5882	Vatican Radio	0030	Italian
5920	Croatian Radio	0030	
5930	Slovak Radio	0100	
5930	R. Prague, Czech Rep.	0000	
5950	Guyana Broadcasting Corp.	0930	
5990	R. Romania Int'l	0400	
5995	R. Australia	1100	
6010	R. Havana Cuba	0430	
6015	R. Austria Int'l. via Canada	0645	
6055	R. Prague, Czech Rep.	0600	
6060	R. Nacional, Argentina	0530	SS
6070	CFRX, Canada	0800	
6075	R. Super, Colombia	1000	SS
6075	Deutsche Welle, Germany	0030	
6088v	R. Esperanza, Chile	1000	SS
6100	Deutsche Welle, Germany	0400	GG
6116	LV del Llano, Colombia	0130	SS
6120	R. Japan	1130	via Canada
6135	Swiss Radio Int'l	0230	
6150	Caracol, Colombia	0400	SS
6155	Radio Austria Int'l	0830	
6165	R. Netherlands, via Bonaire	0030	
6185	R. Nacional Amazonia, Brazil	0000	PP
6185	R. Educacion, Mexico	1000	
6205	R. Quisqueya, Dominican Rep.	0230	SS
6219	Radio Bosnia-Hercegovina	0200	irregular
6245	Vatican Radio	0640	
6305	La Voz del CID (anti-Castro)	0800	SS
6576	R. Pyongyang, N. Korea	1100	
6628	La Voz de San Antonio, Peru	0100	SS
6825	China R. Int'l (feeder)	1000	CC
7100	Voz Res. Galo Negro (clandestine)	2300	PP
7105	REE, Spain	0430	SS
7125	RTV Guinea	0700	FF
7140	R. Italia Int'l	0700	
7150	R. Vilnius, Lithuania	0000	
7170v	ORTS, Senegal	0600	s/on, FF
7170	Voice of America	0500	
7195	R. Ukraine Int'l	0100	
7210	AWR, Italy	0800	
7215	R. Norway	0500	NN
7225	R. Bulgaria	0100	
7235	Deutsche Welle, Germany	0400	AA, via Malta
7250	Vatican Radio	0600, //6245	
7255	V of Nigeria	0500	
7260	R. Netherlands via Russia	1327	s/on, Dutch
7275	ELBC, Liberia	0700	
7285	RT Malienne, Mali	0700	FF
7290	TWR, Swaziland	0255	s/on
7315	R. Zagreb via WHRI	0515	
7370	R. Flanders Int'l, Belgium	0030	
7375	R. For Peace Int'l, Costa Rica	0000	(USB)
7380	Idea Radio, Italy	0800	II
7395	WRNO	0330	
7475	RTT Tunisienne, Tunisia	0500	AA
7580	R. Pyongyang, N. Korea	0900	JJ
7705	RAI, Italy, SSB feeder	0400	II
9022	VOIRI, Iran	0030	EE
9165	R. Omdurman, Sudan	0255	sign on, AA
9275	Icelandic State BC	2300	Icelandic
9345	R. Pyongyang, N. Korea	1300	
9420	Voice of Greece	0130	GG/EE
9445	Voice of Turkey	2330	TT
9455	KHBI, No. Marianas	1000	
9475	R. Cairo, Egypt	0200	
9480	TWR, Monaco	0730	
9505	R. Prague, Czech Rep.	0600	
9510	R. New Zealand	0930	
9510	R. Havana Cuba	0600	
9525	R. Marti, USA	2300	SS
9535	Swiss Radio Int'l	0700	
9540	R. Educadora Bahia, Brazil	0900	PP
9545	Solomon Is. Bc Corp.	0700	
9560	Radio Finland	0300	
9565	R. Universo, Brazil	0900	PP
9570	R. Portugal	0230	
9570	R. Romania Int'l	0230	
9575	Radio Medi Un, Morocco	0730	FF
9575	RAI, Italy	0100	
9580	R. Tirana, Albania	0230	
9600	Vatican Radio	2245	
9600	HCJB, Ecuador	0500	
9605	UAE Radio, Abu Dhabi	2200	s/on
9615	KNLS, Alaska	0800	s/on, CC
9615	R. Veritas Asia, Philippines	1500	CC

Freq.	Station/Country	UTC	Notes
9625	CBC Northern Service, Canada	0300	
9630	R. Aparecida, Brazil	2300	PP
9640	BBC via Antigua	0600	
9645	R. Bandeirantes, Brazil	0000	PP
9650	Swiss Radio Int'l	0000	
9660	ABC, Australia	0900	
9660	R. Rumbos, Venezuela	0230	SS
9690	China Radio Int'l, via Spain	0300	
9695	R. Sweden	0200	
9700	R. New Zealand	1030	
9705	BSKSA, Saudi Arabia	2030	
9705	R. Portugal	0230	
9715	VOA via Thailand	1400	CC
9735	R. Nacional Paraguay	0000	SS
9740	R. Canada Int'l	0630	
9750	R. Korea, So. Korea	1200	
9750	R. Canada Int'l	0530	
9760	R. Canada Int'l	0600	
9765	R. Moscow	0530	
9770	UAE Radio, Abu Dhabi	2159	s/on
9790	R. France Int'l	0130	
9815	Radio Havana Cuba	0200	USB
9830	Croatian Radio	0700	Croatian
9830	R. Jordan	1800	AA
9840	R. Kuwait	2100	AA
9845	FEBC, Philippines	1600	
9860	R. Netherlands via Russia	1100	
9885	BSKSA, Saudi Arabia	2100	AA
9885	Swiss Radio Int'l	0200	
9930	R. Vlanderen Int'l, Belgium	0030	
9935	RS Makedonias, Greece	2000	GG
10030	R. Cario, Egypt	2130	AA
10234	RAI, Italy, feeder	0100	II
11335	R. Pyongyang, N. Korea	1100	
11550	RTT Tunisia	1800	AA
11603	Kol Israel	2230	
11620	All India Radio	2000	
11645	Voice of Greece	1600	Greek
11650	China Radio Int'l	0200	SS
11685	FEBA, Seychelles	0300	
11695	Rep. of Iraq Radio	2230	AA
11695	Radio France Int'l	0530	FF
11705	R. Sweden	2330	
11710	UAE Radio, Abu Dhabi	2330	
11710	RAE, Argentina	0100	
11720	R. Bulgaria	0400	
11725	R. Korea, S. Korea	1000	SS
11740	Vatican Radio	0700	
11740	R. Moscow	0800	
11745	Channel Africa, S. Africa	0200	
11755	R. Finland Int'l	0130	
11785	VOA Thailand relay	1300	
11790	VOIRI, Iran	1200	Urdu/EE
11795	UAE Radio, Dubai	1600	
11795	Deutsche Welle via Rwanda	0200	GG
11800	SLBC, Sri Lanka	0045	
11800	Channel Africa, South Africa	0430	
11805	R. Globo, Brazil	0830	PP
11815	Polish Radio Warsaw	1245	GG
11820	R. Sweden	0100	
11827	R. Tahiti	0300	FF/TT
11835	HCJB, Ecuador	0700	
11835	R. El Espectador, Uruguay	2330	SS
11860	R. Iraq Int'l	0400	
11870	R. Yugoslavia	0040	
11870	AWR, Costa Rica	0100	SS
11880	R. Australia	1600	
11885	UAE Radio, Abu Dhabi	2330	
11890	R. Oman	2100	AA
11925	R. Canada Int'l	0400	
11940	R. Romania Int'l	1300	
11955	R. Nacional, Angola	0600	PP
11960	RTV Malienne, Mali	0900	FF
11970	R. Havana Cuba	0130	
11980	AWR/KSDA, Guam	1600	
11985	UAE Radio, Dubai	2100	AA
11995	R. Sweden	2200	
12005	R. Moscow	1100	
12025	R. Netherlands, via Khazakstan	0300	
12035	Spanish National Radio	1130	SS
12050	R. Cairo, Egypt	0300	AA
13508.5	Australian Armed Forces Radio	1400	
13595	WJCR, Kentucky	2300	
13605	Radio Australia	2300	
13620	R. Kuwait	2000	
13630	RFPI, Costa Rica	2300	
13635	Swiss Radio Int'l	2130	
13650	R. Pyongyang, N. Korea	0000	
13655	R. Flanders Int'l, Belgium	2300	Dutch
13660	R. Havana Cuba (USB)	0200	USB, EE
13675	UAE Radio, Dubai	1630	
13685	Swiss R. Int'l	0700	
13710	VOA Botswana	2130	
13750	AWR Latin America, Costa Rica	1200	s/on
13755	R. Australia	1200	
15020	All India Radio	1400	EE, others
15084	VOIRI, Iran	0430	Farsi
15085	R. Damascus, Syria	2100	
15090	Vatican Radio	2245	s/on
15100	FEBC, Philippines	1400	EE, others
15110	REE, Spain, via Costa Rica	1900	
15120	R. New Zealand Int'l	0530	
15140	R. Nacional de Chile	0000	SS
15170	R. Australia	0900	
15175v	Radio Tahiti	0500	FF/TT
15185	R. Finland Int'l	2300	
15200v	R. Bangladesh	1230	EE
15220	Channel Africa, S. Africa	0600	(ex R. RSA)
15240	Voice of Azerbaijan	1700	
15250	Iraqi Radio	1400	EE
15260	VOIRI, Iran	2100	
15270	HCJB, Ecuador	0730	
15325	Radio Canada via Portugal	1500	
15335	R. Romania Int'l	1430	
15340	R. Japan, via Gabon	2000	RR
15345	RAE, Argentina	2130	
15345	RTM, Morocco	1400	Berber
15355	R. Japan via Gabon	1500	
15360	Deutsche Welle, Germany	2100	
15365	Radio Australia	0330	
15415	Libyan Jamahiriya Broadcasting	1500	AA
15435	UAE Radio, Dubai	0530	
15425	ABC, Australia	0130	
15445	Radio Nacional, Brazil	1245	EE
15470	R. Tashkent, Uzbekistan	1200	
15475	Africa Number One, Gabon	2100	FF
15505	Swiss Radio Int'l	1500	
15505	R. Kuwait	2245	AA
15555	R. Pakistan	1600	
15570	R. Ukraine Int'l	1500	
15575	R. Korea, S. Korea	0030	
15603v	V of Iraqi People (clandestine)	1900	Farsi
15635	V of Greece	1230	
15640	Kol Israel	1400	
15770	INBS, Iceland	1430	Icelandic
16000	VNG, Australia (time stn)	0800	
17490	HCJB, Ecuador	1900	USB
17500	RTT Tunisienne, Tunisia	1400	AA
17550	R. Flanders Int'l, Belgium	1400	
17595	R. Cairo, Egypt	1200	
17605	R. Vilnius, Lithuanaia	0000	
17630	Africa No. One, Gabon	1430	FF
17650	R. France Int'l	1400	
17670	R. Cairo, Egypt	1800	AA
17690	R. Ukraine Int'l	0100	
17710	Channel Africa, S. Africa	1700	
17720	R. Romania Int'l	1430	
17740	R. Yugoslavia	1200	
17740	R. Sweden	1300	EE
17745	R. Algiers, Algeria	1930	
17750	Voice of Free China, Taiwan	2200	
17760	R. Havana Cuba	2030	FF
17770	R. New Zealand Int'l	0300	
17790	Radio Norway Int'l	1900	
17815	RTV Morocaine	1200	AA
17825	R. Japan	0300	
17860	Qatar Bc Service	1300	AA
17870	R. Sweden	1500	
17875	R. Canada Int'l	2130	
17880	R. Finland Int'l	1300	
17900	R. Portugal	2000	PP
17955	V of Iraqi People (clandestine)	1930	Farsi
21490	Radio Austria Int'l	1430	
21500	Radio Sweden	1600	
21505	BSKSA, Saudi Arabia	1600	AA
21545	R. Canada Int'l	1500	
21550	R. Finland Int'l	1430	
21590	R. Netherlands	1845	
21605	R. Yugoslavia	1230	
21625	Radio Sweden	1330	
21655	R. Portugal	1830	PP
21675	R. Kuwait	1500	AA
21700	Radio Japan, via Gabon	1600	JJ
25820	R. France Int'l	1430	FF

BY ROBERT MARGOLIS

THE EXCITING WORLD OF RADIOTELETYPE MONITORING

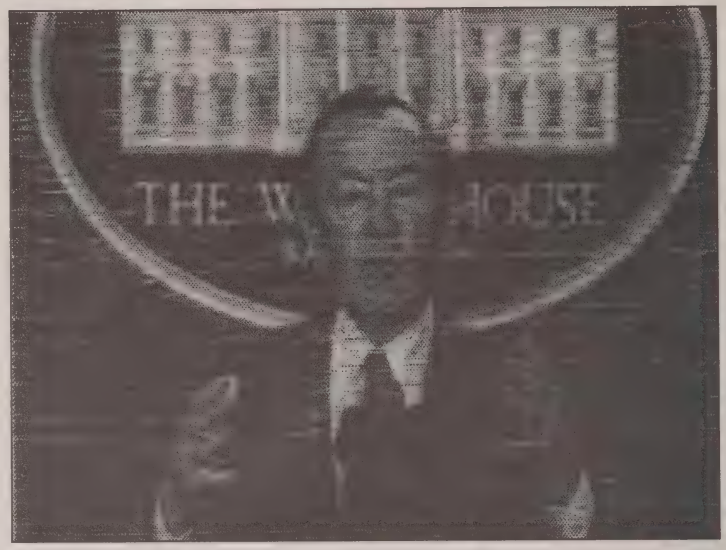
Tune to 19502.0 kHz and you'll find another packet radio link between Andrews Air Force Base, Md., and the Air Forces of Central and South America. You may recall discussion here several times before (most recently in the April issue) about this linkup, heard on another frequency, which provides communications coordination between member countries for the defense of the Western Hemisphere.

The linkup is called the SITFAA net and comms are entirely in Spanish. It is on two circuits, one northern, the other southern. The northern one consists of Andrews AFB; Bogota, Colombia; Santo Domingo, Dominican Republic; Quito, Ecuador; San Salvador, El Salvador; Guatemala City, Guatemala; Tegucigalpa, Honduras; Managua, Nicaragua; Panama City, Panama; Caracas, Venezuela; and Albrook Air Station, Panama. The southern circuit is made up of Buenos Aires, Argentina; Brasilia, Brazil; La Paz, Bolivia; Santiago, Chile; Asuncion, Paraguay; Lima, Peru; and Montevideo, Uruguay.

Several stations in the United States are part of the network. At this time last year they were AFA01, Washington, D.C.; AFA02, Key West, Fla.; AFA03, Bonita Springs, Fla.; and AFA05, Homestead AFB, Fla. The Federal Communications Commission says AFA01 is the callsign for Andrews AFB. Homestead AFB was devastated by Hurricane Andrew in August, 1992, when the net was heard on 14646.5 kHz. When I listened in on the net in June, when it was on 19502.0 kHz, I found that Homestead's callsign had been reassigned to Miles City, Montana, which is on the Yellowstone River, northeast of Billings. (On June 24, the Defense Base Closure and Realignment Commission, which recommends to Congress which American military bases should remain open or be closed, recommended that Homestead be kept open.)

Time out for a thought: Why does the U.S Air Force have AFA05 way up in Montana, apparently in the middle of nowhere, when all the other U.S SITFAA stations are located on the East Coast a lot closer to Central and South America?

Now back to our story: Monitoring the net for 10 days straight in June, from 1300 to 2100 UTC, I found the active participants to be AFA01; CAKQN, Santiago, Chile; CX2XA, Montevideo, Uruguay; and ZWU26, Brasilia, Brazil. Once in a while AFA02 and AFA05 would poke their noses into the net and announce their presence, but would send no messages (a message is called a "sitfagrama"). Other stations were occasionally heard, but their signal strengths for the most part were too weak for my RTTY decoder to notice them. Their callsigns popped up now and then, and looked strangely out of place to be part of the net. Most of those callsigns had missing characters, probably because the radio signals were zapped by atmospheric disturbances. Here are some of those callsigns: HN_HQT, 99G_CY, 3B_MCO, 0YFA0_, _YU1/W, ZV41_F, QOR_LA LUB_RE, PGA1C9, JA__M5, 8HT_3_, 583S5A, _RBVGA, Z4W__O, OIF_2_, 3WQUEM, O_G16Y, 5I_1/0, O3OC3L, R_A_LO, GI5E4B, _Q9KU_, L2M65H, 6_N5W_, and 6/LDX4. Most of them sent no traffic; what supposed messages there



Agence France-Presse faxphoto of US Secretary of State Warren Christopher was sent by AZG641, Buenos Aires, Argentina on 11480 kHzat 2309 UTC, 60/288 (FromRobert Margolis.)

```
0000500000 m00285264 p00097040 p00512918 sparespare

apt 137.50 mhz, hrpt 1698.0 mhz, bcn dsb 136.77 mhz. apt day/night

2,4. vis ch 2 /0.725 to 1.0/ and ir ch 4 /10.5 to 11.5/ xmtd

continuously.  dcs clk yr/day/time 91 257 45712.8818.

last tip clk corr 12/08/92. clk err aftr corr plus  0.40 sec.

clk err as of =&/09/.+ minus 00.50 sec.  err rate as of 04/05/93

minus  7 msec/day. next clk corr 05/24/93.

note: the noaa 10 avhrr instruments data may not be usable due

to scan motor problems.  noaa is investigating.

note:  effective 11/11/92, apt channel switching during s/c night

discontinued u.f.n.

nnnn
```

Problems with the NOAA 10 weather satellite are mentioned in this notice from GFL22, Bracknell Meteo, England. It ran at 50 baud on 6835 kHz, at 1956 UTC. (From Ary Boender of The Netherlands.)

were seemed to have nothing to do with the SITFAA net. Twice I saw AFA02, Key West, Fla., send an ident to AFQ through repeater station ADW. AFQ and ADW are legitimate callsigns for U.S. Air Force bases, but I don't know which ones, or their roles with the SITFAA net. It appears that the callsign for Quito, Ecuador, is HD1FAE. It was mentioned in a message between Andrews AFB and Santiago, Chile, but no location was given for it.

"Bunky" from Illinois writes, "In the June issue, you showed a copy of a message you copied from WNY on 16448 kHz There are a bunch of similar stations that I have copied. "They are BAR on 18128, 50 baud at 1215; GMN on 18128, 75 baud at 1650; KRN on 18196, 75 baud at 1730; KRN on 14468, 75 baud at 1740; and SPK on 18846, 50 baud at 1610." "Bunky" says he "recently found that when KRN is finished with his 1730 transmission on 18196, he immediately tunes up on 14468 and repeats the same thing."

"The numbers after the callsign (at the beginning) indicate the number of messages and the number of blocks 'KRN 1/50' would mean one message with 50 groups I have seen both five-digit and five-letter crypto groups. I wonder how many of these stations use more than one frequency as KRN does. They seem to be on most days except Sunday. BAR is perhaps the least active (not on every day) and seldom sends many messages," says "Bunky."

NARC ARQ Dept.: An unidentified station, whose radio signal suffered from deep fadeouts, was seen sending the selcal "NARC" in ARQ on 14452.9 kHz, from 1428 to 1441 UTC in June. Spotted among a lot of garbling was "KHA950," which might be a callsign. Three federal agencies, Federal Emergency Management Agency, National Aeronautics and Space Administration, and Nuclear Regulatory Commission, are noted to be on assigned frequencies near the one in use. Is it one of those three or something else? Please send your thoughts to us.

Pecked FEC Dept.: A strange looking pile of FEC messages appeared on 10765.8 kHz at 1700 UTC on June 11. They were either all in numbers or letters grouped in threes and with some groups repeated a few times (see figure 1). The transmission by the unidentified station ended with a signoff in CW at 1722.

Last November, I wrote about two stations, CHA and CHC, who sent messages loaded with cuss words to each other. This took place on June 25, 1992, at 1745 UTC on 13415.5 kHz, 85/50N. I mentioned that "Pronto" broke in on their transmission and ordered the two to quit "fooling around." Later, "Acorn" came up and told them that the use of their communications equipment was "not for some kind of game."

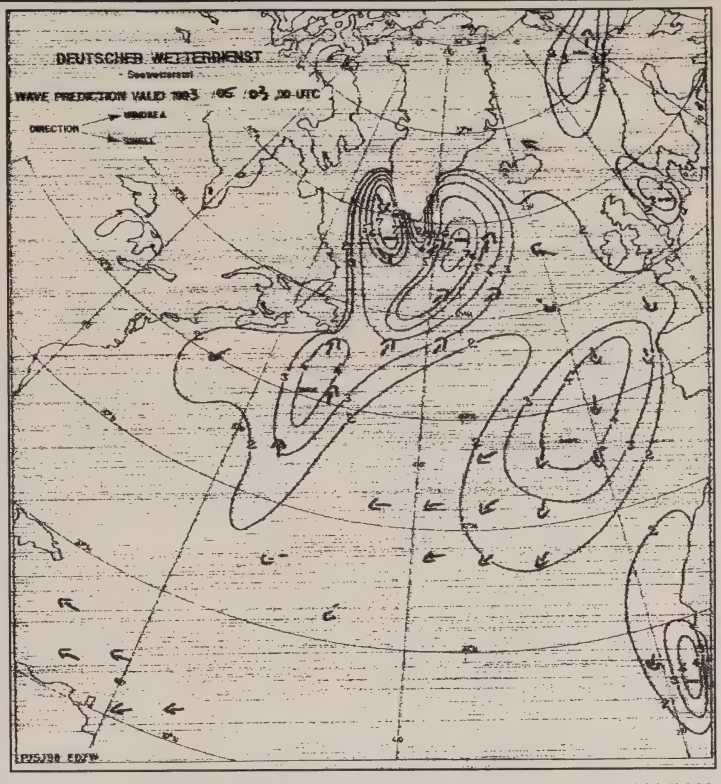
Jim Devine of Ontario, Canada, sent a letter in June in which he says he believes he can "help identify some of the personalities involved." "The code name 'Pronto' and 'Acorn" referred to in the text," Devine says, "are known as Appointment Titles. (They) are unclassified names used to refer to branch or corps representatives within the Canadian Army. They are meant only to conceal the person's function and do not equate to the level of command. Therefore, the soldier referred to as 'Ironsides,' the Armor representative, could be a sergeant or a colonel—one would never know."

"'Pronto' refers to the Signals representative and 'Acorn,' the Intelligence representative," Devine says. "Being that the stations were in RTTY, this is likely a Brigade or higher net, and, being that this was logged on 25 June (1992), CHA and CHC were likely units participating in Exercise Rendezvous '92 at Canadian Forces Base, Wainwright, Alberta." "Now your readers can know why Pronto and Acorn were correct and had every right to dump on CHA and CHC for their X-rated traffic," he says.

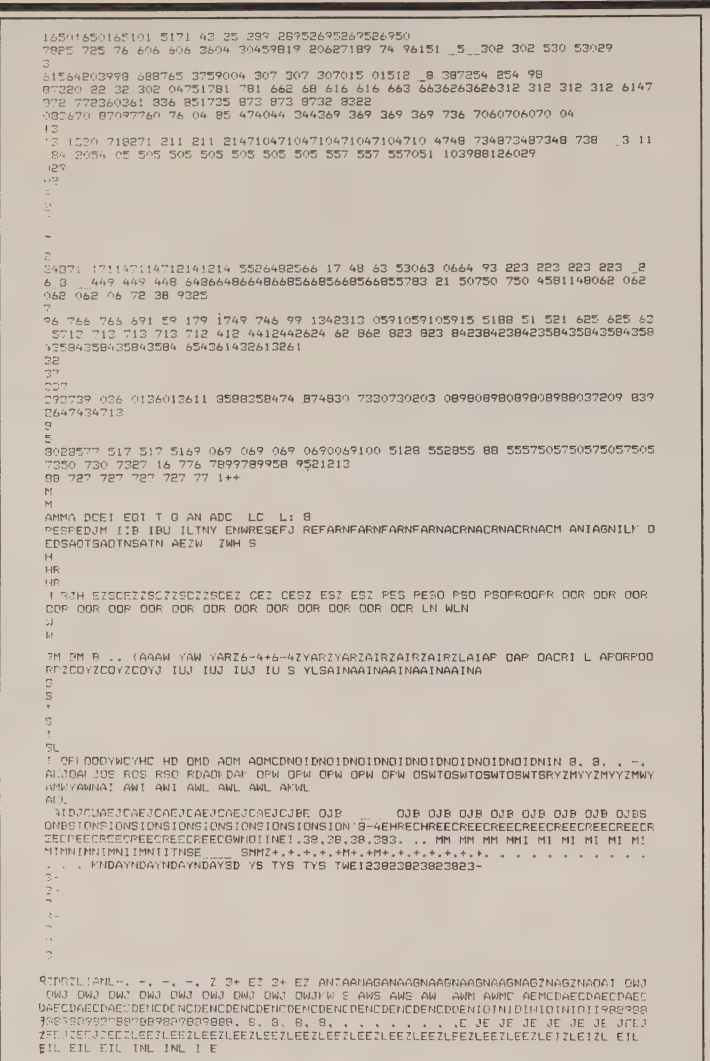
Hello, Europe. Are you there? Throughout most of Spring 1993, hardly any RTTY or FAX stations from Europe were heard at my listening post at The RTTY Ranch because of poor propagation. Radio signals from the other continents were barely disrupted, however. This is the longest length of time that I've witnessed bad listening conditions in the 10 years I've been monitoring utility stations. A couple of years ago there was a signal drought that lasted for about six weeks. This recent spell, however, was twice as long. Judging from the loggings sent in by our contributors, many of you didn't fare much better.

One station in Europe, however, always managed to be strongly heard on this side of the ocean—the foreign affairs ministry at Belgrade, Yugoslavia. It seems that the Serbs were intent on telling their side of the story surrounding the huge civilian war casualties in Bosnia and Herzegovina, and they pumped macho wattage into their radio transmitters so the whole world could hear them.

Stax of Fax Dept.: On June 20 at 1635 UTC, GFE23, Bracknell Meteo, England, released a radiofax notice on 14436.0 kHz about a planned changed in its transmission schedule. The notice was sent horizontally instead of vertically and streaky lines caused by atmospheric noises covered parts of many words, making it somewhat difficult to read on the video monitor. The notice, where readable, read, "Notice to recipients of GFE. The future of the GFE ser-



Wave prediction chart of DDK6, Pinneberg Meteo, Germany, ran on 13882.5 kHz at 2141 UTC, 120/576. (From Robert Margolis.)



FEC transmission from an unidentified station was on 10765.8 kHz at 1700.(From Robert Margolis.)

vice operated by the UK meteorological office has recently been reviewed. For the time being, the...of products for aviation users will continue, but it is expected that this service will be suspended by a...sponsored by ICAO...operated by the UK Met Office.

"...broadcasts are costly to operate ...that GFE should be merged with GFA into a single broadcast with revised schedule of products. It is planned to operate the merged broadcasts...from 0001Z 1 September 1993. The revised...will be notified...the time of the change.

"The intention to modify GFE was discussed in the...the recent meeting of this Work Group on Planning and is...of World...in Region VI. The meeting...the notification should be given to National Meteorological Service through the monthly newsletter in the operation of...and...in the GFE Service. This notice...out the wish of that...

"Recipients of GFE who require further information about this notice should write to..." Then a six-line mailing address was given and the notice ended with, "Notices are being broadcast on the GFA and GFL services also."

Newsphotos from Agence France-Presse and Noticias Argentinas are now being sent at 2300 UTC on either 7931.0 or 7932.0 kHz. I've sent both frequencies being used on different days. Running the pictures, between 2300 and 0000 UTC, is AZG902, Buenos Aires, Argentina.

On June 24 at 2316 UTC, I came across the station for the first time as it sent a newsphoto on 7931.0 kHz at 60/288. Due to bad propagation that clouded the photo with streaky lines, I couldn't determine where the transmission was coming from. Another picture was sent at 2327 UTC, and again at it was difficult to read the caption line. Then, at 2344 UTC, the speed and IOC changed to 240/440, a rarity for shortwave radio radiofax broadcasts, and another photo appeared. The setting of 240/440 is usually found on satellite radiofax broadcasts. The transmission ended at around 2350 UTC. No broadcast was heard the next night.

Four days later, I heard the station at 2303 UTC. This time it was on 7932.0 kHz. Four photos were sent, all at 60/228, and the station went down at 2352 UTC. Better propagation enabled me to see that the photos were from A.F.P. and N.A. The callsign of the transmitting station was found in files of the International Telecommunications Union.

This broadcast continues that of AZG641, also from Buenos Aires, which runs A.F.P. and N.A. photos on 11480 kHz from 2100 to 2300 UTC. When heard in June, the quality of transmission from AZG902 was better than AZG641's.

NAM, Norfolk Naval Base, Va., sent hurricane warning messages as daily exercises during the second week of June. The messages, labeled with the word "exercise" three times across the top and bottom of

the radiofax notices, appeared at around 2130 UTC.

Text in Chinese was seen in a newsfax broadcast on 13900 kHz at 1520 UTC. The text was split into two columns and ran at 120/576 There's no ident yet for this station.

Two issues ago I said that I was going to buy a spectrum analyzer as an aid to finding RTTY and fax stations on the satellites I now have one and find it to be a valuable tool in determining which transponders carry the data tranmissions I seek. Better yet, I find it extremely helpful for monitoring RTTY stations on shortwave radio. I wish I bought one 10 years ago, when I began this hobby. As I monitor a RTTY station I can easily see when another one comes up on a nearby frequency. I can then quickly jump to the new station and log it at the start of its transmission.

During the first couple of weeks I had the instrument, when propagation was terrible, I saw hardly any radio activity of any kind on the 18, 19, and 20 MHz bands. I would then devote most of my time to viewing the lower bands where a few RTTY stations could be found. Even with a spectrum analyzer, however, there's still a need for finding RTTY stations the old fashioned way—laboriously turning the tuning knob. That's because the transmitting power of many stations is so weak that a spectrum analyzer will hardly notice them.

My spectrum analyzer gives a frequency readout that very accurately matches the one shown on the shortwave receiver. I feel like a fox in a hen house as I chase the many frequencies that pop up on the instrument's gridded green screen. Spectrum analyzer's are expensive—mine cost well over $2,000—but for what it can do, saving time by cutting down on all knob twirling that goes with hunting the numerous RTTY stations, the price is worth it.

The model I use is from ITC Instruments Inc. of San Diego, Calif., and was purchased through B & B Instruments of El Cajon, Calif. (1-800-527-5439).

Abbreviations Used In The RTTY Column

AA	Arabic
ARQ	SITOR mode
BC	Broadcast
EE	English
FEC	Forward Error Connection mode
FF	French
foxes	"Quick brown fox. . ." test tape
GG	German
ID	Identification/Ied
MFA	Ministry of Foreign Affairs
nx	News
PP	Portuguese
RYRY	"RYRY . . ." test tape
SS	Spanish
tfc	Traffic
w/	With
wx	Weather

RTTY Intercepts

2137.5: WLC Rogers City R., Mich., w/Great Lakes wx, FEC at 0115. ("Bunky," Ill.)

4004.6: LRO2, Telam, Buenos Aires, Argentina, w/nx in SS, 837/50 at 0252. (Robert Hall, RSA)

5738.0: 9GC, Accra Air, Ghana, w/RYRY at 0144, 425/50. (Harold Manthey, N.Y.)

5848.0: TUH55, ASECNA, Abidjan, Ivory Coast, w/RYRY at 0316, 410/50. (Hall, RSA)

7713.2: TJK, ASECNA, Douala, Cameroon, w/coded wx on both TDM channels, ARQ-M2/96 at 2357. (Ed.)

7715.5: Un-ID chitchatting in SS, ARQ, 0054-0110. (Ed.)

8961.8: "Lima 2 Alfa" w/5L msgs to "Delta 5 Charlie," 850/50 at 0429. Might be LOR, Puerto Belgrano Navrad, Argentina, because coded grps began w/SYNCB UNCFE & ended w/ENDSY NCUGV. SYNC & ENDSYNC letter strings are characteristic of Argentine cipher system Sta also sent "rutina" msgs in SS & meteo msgs (Ed.)

9040.8: 5YE, Nairobi Meteo, Kenya, w/coded wx, 850/100 at 0352. (Ed.)

9193.0: BAA23, Beijing Meteo, China, w/coded wx, 854/50 at 1835.(Ed.)

9330.2: XVN26, VNA, Hanoi, Vietnam, w/nx in EE, 518/50 at at 1525. (Hall, RSA)

9395.1: HMF84, KCNA, Pyongyang, North Korea, w/nx in EE at 1510, 258/50. (Hall, RSA)

10257.8: AFRTS w/AP nx on one FDM channel at 1750, 50 baud. ("Bunky," Ill.)

10268.5: Un-ID w/encryption, ARQ at 1945 (Ed.)

10280.5: Un-ID French Mil. w/"controle de voie," ARQ-E3/96 at 0025. (Manthey, N.Y.) It's RFLIG, Cayenne, French Guiana—Ed.

10399.0: Tanjug, Belgrade, Yugoslavia, w/nx in EE at 1442, 425/75. (Ed.)

10460.0: Un-ID sending HCGI selcal 1533-1600, ARQ. Msgs in SS seen at 2057. (Ed.)

10521.7: RFLI, French Navy, Fort de France, Martinique, w/a poor sig & constant fadeouts, ARQ-E3/192 at 1432. Using new freq. (Ed.)

10536.0: CFH, Canadian Forces, Halifax, Nova Scotia, w/coded wx at 2225, 75 baud. ("Bunky," Ill.)

10580.1: HMK25, KCNA, Pyongyang, North

YOU AIN'T HEARD NOTHIN' . . . YET

Since 1967, CRB Research has been the world's leading publisher and supplier of unique hobby and professional books and information including:

- Scanner Frequency Guides
- Shortwave Frequency Guides
- Military/Federal Communications
- Broadcast Station Registries
- Undercover Communications
- Survival Communications
- Covert Operations
- & Other Related Topics!

New titles are constantly being added to our exciting catalog. If it's interesting and unusual, we've got it. You'll see. Ask for our latest FREE catalog.

Business Hours: 9 am to 3 pm Eastern (Mon., Tues, Thurs., & Fri.,). Closed Wed. and Holidays.

CRB RESEARCH
P.O. Box 56, Commack, NY 11725
Phone: (516) 543-9169/FAX: (516) 543-7486

CIRCLE 11 ON READER SERVICE CARD

HALLELUJAH!

UNLOCK FULL 800 COVERAGE

Cellular Security Group Announces. . .
New-800MHz RESTORATION SERVICE
(for your factory blocked scanner)

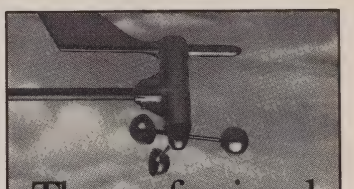
Warranty and Service Plan Protection
Same Day Service — Free Insured UPS Return Shipping
Unconditional Satisfaction Guarantee (refund and free relock)

$40.00

Call for details: 508-281-8892

Ship to: Cellular Security Group
106 Western Avenue, Essex, MA 01929

See our ad on page 61 for details on other products!



The professional weather station comes home.

Thanks to the Weather Wizard II, now you can have a fully sophisticated weather monitoring system right in your own home. Weather Wizard II has all it takes to watch the weather like the pros. All for only $250.

FEATURES INCLUDE:
- Inside & Outside Temps
- Wind Speed & Direction
- Wind Chill
- Time & Date
- Alarms
- Highs & Lows
- Instant Metric Conversions
- Rainfall Option
- Optional PC Interface

WEATHER WIZARD II
THE PROFESSIONAL HOME WEATHER STATION

Only $250. Add $75 for self-emptying rain collector.
Order today: 1-800-678-3669 • key code CM634H

M - F 7 a.m. to 5:30 p.m. Pacific Time • FAX 1-510-670-0589
M/C and VISA • Add $8 for shipping. CA residents add sales tax.
One-year warranty • 30-day money-back guarantee

DAVIS INSTRUMENTS 3465 DIABLO AVE., HAYWARD, CA 94545

CIRCLE 60 ON READER SERVICE CARD

Korea, w/nx in EE, 260/50 at 1508. (Hall, RSA)

10600.2: XVN37, VNA, Hanoi, Vietnam, w/nx in EE at 1521, 505/50 (Hall, RSA)

10894.0: LRB39, Telam, Buenos Aires, Argentina, w/nx in SS at 0000, 50 baud. (Ed.)

11118.5: AFS, Offutt AFB, Elkhorn, Nebr., w/KAWN wx data, 75 baud at 2220. ("Bunky," Ill.)

11270.5: "V52" and "Magic 52" (both w/NATO Geilenkirchen) w/encrypted msgs, 75 baud at 1053 and 1218 respectively. (Ary Boender, NLD)

11537.0: HDN, Quito Navrad, Ecuador, w/ RYRY & SGSG, 1340-1345, 850/75 (Manthey, N.Y.)

11606.2: BZS21, Xinhua, Yuryumqi, CHina, w/nx in EE at 1500, 430/75 (Hall, RSA)

12212.5: YZO7, Tanjug, Belgrade, Yugoslavia, w/nx in FF, 425/50 at 1609. (Ed.)

12220.5: RPFRW, Portuguese Air Force, Madeira, Portugal, w/msgs to Ponta Delgada, Azores, ARQ at 2050. (Hetherington, Fla.)

12228.5: BZR62, Xinhua, Yuryumqi, China, w/nx in EE, 295/75 at 1616 (Ed.)

12480.0: 9HWF2, ship "Giovanna," w/Telex saying it arrived at Lagos, Nigeria, and held comms w/"East Mole station" there "on CH 12 of VHF." Was ARQ at 2126. (Ed.)

12741.3: HWN, Paris Navrad, France, w/RYRY & SGSG at 1540, 850/75. (Manthey, N.Y.)

13365.8: 5YD, Nairobi Meteo, Kenya, w/RYRY, 50 baud at 2210 ("Bunky," Ill.)

13372.8: 5YD w/RYRY, 250/50 at 1936. (Ed.)

13392.0: DFZG, MFA, Belgrade, Yugoslavia, w/AP, Tanjug, Reuters & Izvestia nx in SC, FEC-A/144 at 0010. (Hetherington, Fla.)

13527.2: Un-ID w/long periods of ARQ idling or w/TVMY selcal, at 1322. (Ed.)

13530.0: RVW53, Moscow Meteo, Russia, w/coded wx, 1000/50 at 1320. (Ed.)

13562.8: 3MA22, CNA, Taipei, Taiwan, w/ RYRY, 850/50 at 1317 (Ed.)

13580.0: HMF36, KCNA, Jungsan, North Korea, w/nx in FF at 1313, 250/50. (Ed.)

13916.5: Un-ID w/5L grps, ARQ at 1710. (Ed.)

13927.0: Un-ID w/several 5L grpd msgs, 1120-1135, 850/75. (Ed.).

13927.7: DMK, MFA, Bonn, Germany, w/tfc at 0950, ARQ E/96(Hetherington, Fla.)

13940.0: KCNA, Pyongyang, North Korea, w/nx in FF, 250/50 at 1210. (Ed.)

13941.5: "L3 de S1 BV BSR INT QSA INT QRU KKK" seen in FEC at 1818, & "S1 de L3" + RYRY seen at 1821. Probably Tunisian diplo stas. (Ed.)

13950.0: CLP65, Cuban Emb., Managua, Nicaragua, w/telegrams to CLP1, 425/100 at 1512. (Ed.)

14352.8: Swedish Emb., Caracas, Venezuela, w/350 5L grps at 1447, SWED-ARQ. (Ed.).

14356.0: GFL24, Bracknell Meteo, England, w/RYRY at 2345, 50 baud. ("Bunky," Ill.)

14367.0: BZP54, Xinhua, Yuryumqi, China, w/nx in EE at 1225, 75 baud. ("Bunky," Ill.).

14478.5: OEC, MFA, Vienna, Austria, w/nx in GG at 1300,.ARQ-S6/96. (Ed.)

14481.7: RFTJ, French Forces, Dakar, Senegal, w/worldwide monetary exchange rates list at 0245, ARQ-E3/48. (Ed.)

14485.7: RFLIG, French Mil., Cayenne, French Guiana, w/"non protege" tfc to Paris, ARQ-E3/192 at 1449. (Ed.)

14524.0: Possibly SAM, MFA, Stockholm, Sweden, w/5L grps, SWED-ARQ at 1428. (Ed.)

14607.8: PWN, Natal Navrad, Brazil, w/navareas in PP, 850/75 at 1436. (Ed.)

14633.2: 9UA, Bujumbura Air, Burundi, w/ RYRY, 406/50 at 0755.(Hall, RSA)

14736.0: "TLH" w/RYRY, foll by 2 5L-grpd msgs, one headed w/11177 00125 65703 21808 03409, the other w/11177 00125 26613 21809 01039. Was 425/75 at 1421. A couple of readers who study RTTY numbers stas. asked me to include the header info w/my loggings, so here they are! (Ed.)

14762.2: NNN0ICE, USN MARS, McMurdo Sta., Antarctica, w/MARSgrams in FEC at 2345 & 0200. (Hetherington, Fla.)

14731.0: NMF, USCG, Boston, Mass., w/unclas tfc to NRCB, the sail training cutter "Eagle" (WIX-327), at 1920 & 2215, ARQ. Was on 18336.7 kHz at 1915 before moving down to this freq. (Ed.)

14764.0: A9M70, GNA, Manama, Bahrain, w/nx in EE at 1550, 425/75. (Manthey, N.Y.)

14786.5: 9PL, Kinshasa Air, Zaire, w/RYRY, 50 baud at 2330.("Bunky," Ill.)

14805.0: "BPA BPA BPA 1/3" + RYRY, foll by 5F msg headed w/11177 00116 00000 13121 00031. 5F msg read "73932 11111" & was foll by QRU QRU SK SK. Xmsn ran 1522-1524, 425/75. (Ed.)

14806.0: Un-ID sending 5F msgs, 500/75 at 1532. Last msg w/header "11177 00116 61531 03114 01479." QRU QRU SK SK at 1533.(Ed.)

14808.0: GXQ, British Army, London, England, w/foxes, 10 count, & RYI's, FDM 170/50 at 1355. (Ed.)

14880.0: JMG4, Tokyo Meteo, Japan, w/coded wx, 850/50 at 1830. (Hetherington, Fla.)

14983.0-14985.0: Un-ID w/all 12 FDM channels encrypted, 170/75 at 1640. (Ed.)

14989.0: TNL, ASECNA, Brazzaville, Congo, w/coded wx at 1605, ARQ-E3/96. (Ed.)

15011.7: MFA, Cairo, Egypt, w/msgs in AA, ARQ at 1927. (Ed.)

15633.0: HMF26, KCNA, Pyongyang, North Korea, w/nx at 1312, 50 baud. (Boender, NLD)

15655.0: CNM66, MAP, Tanger, Morocco, w/nx at 1314, 50 baud (Boender, NLD)

15897.8: AFRTS w AP/UPI nx on one FDM channel, 50 baud baud at 2150. ("Bunky," Ill.)

15922.4: DGP92H3, PIAB, Bonames, Germany, w/nx in GG to South America, FEC-A/96 at 2000. (Hetherington, Fla.)

16017.4: DFQ21, PIAB, Bonames, Germany, w/nx in GG, FEC-A/96 at 1908. (Ed.)

16067.0: IRO30, ANSA, Rome, Italy, w/nx in EE, 425/50 at 1830. (Ed.)

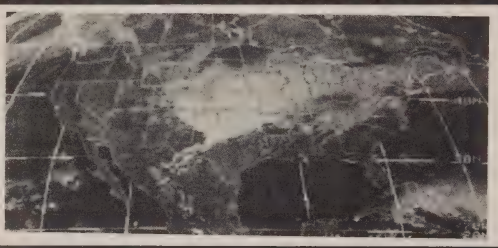
16081.7: Un-ID Egyptian diplo w/tfc in AA, ARQ at 1404. (Ed.)

16098.0: HBD80, Swiss Emb., QTH unknown, w/"This is HBD80. We are QRU. Tks for your call." Was ARQ at 1311. (Ed.).

16117.0: 6VK317, PANA, Dakar, Senegal, w/nx in EE & FF, 350/50 at 1315. (Manthey, N.Y.)

16119.9: HBD64, Swiss Emb., Bonn, Germany, idling in ARQ, 1412-1500, then sends "VON BONN QSL AND ERE QRU QRU???" (Ed.)

PC HF FACSIMILE 6.0 $99



NOW EVEN BETTER!

Version 6.0 has just been released. It is the most comprehensive fax image reception system for the IBM PC and compatibles. It includes an FSK demodulator, advanced signal processing software, tutorial cassette, and complete 250 page reference manual. The software includes the following advanced features:

- Menu Driven
- Start/Stop Tone Recognition
- Unattended Operation
- Tuning Oscilloscope
- Resolution up to 1280x800x256 Levels
- Programmable Colorization
- Brightness and Contrast Control
- Transmit Option Available
- Image Zoom, Scroll, Pan, Rotation
- CGA,HGA,EGA,VGA & Super VGA
- Time Lapse Frame Looping
- Slide Shows
- Export to PCX & GIF Files
- Grayscale on all Popular Printers
- Programmable IOC & Line Rates
- Online Broadcast Database
- Image Cropping
- True Color Press Photos

PC GOES/WEFAX $250

PC GOES/WEFAX 3.0 is our finest fax imaging system. It is compatible with both HF and direct satellite broadcasts from GOES, METEOSAT NOAA, SOVIET APT and C-Band services. It includes all of the above features plus a complete prediction system and advanced multispectral analysis software.
Call or write for our catalog of products. Visa & MasterCard welcome.

Software Systems Consulting
615 S. El Camino Real, San Clemente, CA 92672
Tel.(714) 498-5784 Fax.(714) 498-0568

CIRCLE 6 ON READER SERVICE CARD

AR-33B
VHF FM
RECEIVER

THE AR-33B IS A LIGHTWEIGHT, MINIATURE VHF FM RECEIVER. IT INCLUDES MANY PROFESSIONAL COMMUNICATION QUALITY FEATURES FOR THE SERIOUS USER.

- Runs on 2 "AA" batteries.
- 140-170MHz coverage in 5kHz steps.
- Easy to use digital thumbwheel tuning.
- Microprocessor controlled solid state design.
- 2 memory channels for instant frequency recall.
- 4 varactor tuned stages in front end that track with frequency selection.
- .22uv sensitivity, 12db SINAD.
- Adjacent channel rejection 65db at ±25kHz.
- Spurious rejection is better than 60db in band, and 70db out of band.
- No birdies 140-170MHz.
- Size 5.2"x2.5"x1.0" - Weighs 7.3 oz.
- Supplied with batteries, earphone, rubber flex antenna, antenna adapter, and manual.
- F.C.C. approved.
- Full 1 year warranty.
- Same day delivery.

COMMUNICATIONS SPECIALISTS, INC.
426 WEST TAFT AVENUE • ORANGE, CA 92665-4296
(714) 998-3021 • FAX (714) 974-3420
Entire U.S.A. (800) 854-0547 • FAX (800) 424-3420

A QUALITY PRODUCT OF AOR

CIRCLE 96 ON READER SERVICE CARD

Scanners/Shortwave/GMRS/Ham

COMMUNICATIONS ELECTRONICS INC.
Emergency Operations Center

We're introducing new Uniden *Bearcat* scanners that are just what you've been searching for. Order your *Bearcat* scanner today.

Radio Scanners

NEW! Bearcat® 2500XLT-F

List price $649.95/**CE price $344.95/SPECIAL**
400 Channels • 20 Banks • Turbo Scan
Rotary tuner feature • Auto Store • Auto Sort
Size: 2-3/4" Wide x 1-1/2" Deep x 7-1/2" High

Frequency Coverage	*Default Steps*
25.000 - 25.995 MHz. (AM)	5.0 KHz
26.000 - 28.995 MHz. (AM)	5.0 KHz
29.000 - 53.995 MHz. (NFM)	5.0 KHz
54.000 - 71.995 MHz. (WFM)	50.0 KHz
72.000 - 75.995 MHz. (NFM)	5.0 KHz
76.000 - 107.995 MHz. (WFM)	50.0 KHz
108.000 - 136.995 MHz. (AM)	12.5 KHz
137.000 - 173.995 MHz. (NFM)	5.0 KHz
174.000 - 215.995 MHz. (WFM)	50.0 KHz
216.000 - 224.995 MHz. (NFM)	5.0 KHz
225.000 - 399.995 MHz (AM)	12.5 KHz
400.000 - 511.995 MHz. (NFM)	12.5 KHz
512.000 - 549.995 MHz. (WFM)	50.0 KHz
760.000 - 823.995 MHz (NFM)	12.5 KHz
849.0125 - 868.995 MHz (NFM)	12.5 KHz
894.0125 - 1,300.000 MHz. (NFM)	12.5 KHz

Signal intelligence experts, public safety agencies and people with inquiring minds that want to know, have asked us for a world class *handheld* scanner that can intercept just about any radio transmission. The new Bearcat 2500XLT has what you want. You can program frequencies such as police, fire, emergency, race cars, marine, military aircraft, weather, and other broadcasts into 20 banks of 20 channels each. The new rotary tuner feature enables rapid and easy selection of channels and frequencies. With the AUTO STORE feature, you can automatically program any channel. You can also scan all 400 channels at 100 channels-per-second speed because the Bearcat 2500XLT has TURBO SCAN built-in. To make this scanner even better, the BC2500XLT has AUTO SORT – an automatic frequency sorting feature for faster scanning within each bank. Order your scanner from CEI.

For more information on Bearcat radio scanners or to join the Bearcat Radio Club, call Mr. Scanner at 1-800-423-1331. To order any Bearcat radio product from Communications Electronics Inc. call 1-800-USA-SCAN.

Great Deals on Bearcat Scanners

NEW! Bearcat 8500XLT-F base/mobile	$379.95
NEW! Bearcat 890XLT-F base/mobile	$254.95
NEW! Bearcat 2500XLT-F handheld	$344.95
Bearcat 855XLT-F base	$159.95
Bearcat 800XLT-F base/SUPER SPECIAL	$199.95
Bearcat 760XLT-F base/mobile/SPECIAL	$229.95
Bearcat 700A-F info mobile	$169.95
Bearcat 560XLA-F base/mobile	$89.95
Bearcat 350A-F info mobile	$119.95
Bearcat 210XLT-F base/SPECIAL	$119.95
Bearcat 200XLT-F handheld/SPECIAL	$208.95
Bearcat 148XLT-F base w/ weather alert.	$94.95
Bearcat 147XLT-F base	$83.95
Bearcat 100XLT-F handheld	$149.95
Bearcat 70XLT-F handheld/SPECIAL	$119.95
Bearcat 65XLT-F handheld/SPECIAL	$99.95
Bearcat BCT2-F info mobile	$139.95

New FCC Rules Mean Last Buying Opportunity for Radio Scanners

On April 19, 1993, the FCC amended Parts 2 and 15 of its rules to prohibit the manufacture and importation of scanning radios capable of intercepting the 800 MHz. cellular telephone service. Supplies of full coverage 800 MHz. scanners are in *very* short supply. When this inventory is exhausted, there will be no more full coverage scanners available to our U.S. customers. If you have an inquiring mind that wants to know, today could be your last opportunity to own a Bearcat 800XLT scanner. Call Communications Electronics now to order your scanner.

Bearcat® 800XLT-F

List price $549.95/**CE price $199.95/LAST CHANCE**
40 Channels • 12 bands • 2 banks • Priority
Wide 800 MHz. coverage • Search/Scan • AC/DC
Bands: 29-54, 118-174, 406-512, 806-912 MHz.

The Uniden 800XLT receives 40 channels in two banks. Call CEI now at 1-800-USA-SCAN before they're gone.

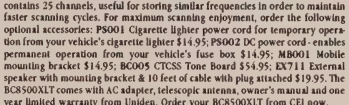
NEW! Bearcat® 8500XLT-F

List price $689.95/**CE price $379.95/SPECIAL**
500 Channels • 20 banks • Alphanumeric display
Turbo Scan • Weather Alert • Priority channels
Auto Store • Auto Recording • Reception counter
Frequency step resolution 5, 12.5, 25 & 50 KHz.
Size: 10-1/2" Wide x 7-1/2" Deep x 3-3/8" High

Frequency Coverage:

25.000 - 28.995 MHz. (AM), 29.000 – 54.000 MHz. (NFM), 54.000 - 71.995 MHz. (WFM), 72.000 - 75.995 MHz. (NFM), 76.000 - 107.995 MHz. (WFM), 108.000 – 136.995 MHz. (AM) 137.000 – 173.995 MHz (NFM), 174.000 - 215.995 MHz. (WFM), 216.000 – 224.995 MHz. (NFM), 225.000 – 399.995 MHz. (AM) 400.000 – 511.995 MHz. (NFM), 512.000 - 549.995 MHz. (WFM) 760.000 – 823.9875 MHz (NFM), 849.0125 – 868.9875 MHz (NFM) 894.0125 – 1,300.000 MHz. (NFM).

The new Bearcat 8500XLT gives you pure scanning satisfaction with amazing features like Turbo Scan. This lightning-fast technology featuring a triple conversion RF system, enables Uniden's best scanner to scan and search up to 100 channels per second. Because the frequency coverage is so large, a very fast scanning system is essential to keep up with the action. Other features include ***VFO Control*** – (Variable Frequency Oscillator) which allows you to adjust the large rotary tuner to select the desired frequency or channel. ***Weather Alert*** – Lets your scanner function as a severe weather warning radio. ***Auto Store*** – Automatically stores all active frequencies within the specified bank(s). ***Auto Recording*** – This feature lets you record channel activity from the scanner onto a tape recorder. You can even get an optional *CTCSS Tone Board* (Continuous Tone Control Squelch System) which allows the squelch to be broken during scanning only when a correct CTCSS tone is received. ***20 banks*** – Each bank contains 25 channels, useful for storing similar frequencies in order to maintain faster scanning cycles. For maximum scanning enjoyment, order the following optional accessories: **PS001** Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter $14.95; **PS002** DC power cord - enables permanent operation from your vehicle's fuse box $14.95; **MB001** Mobile mounting bracket $14.95; **BC005** CTCSS Tone Board $54.95; **EX711** External speaker with mounting bracket & 10 feet of cable with plug attached $19.95. The BC8500XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited warranty from Uniden. Order your BC8500XLT from CEI now.



CB/GMRS Radios

The new Uniden GMR100 is a handheld GMRS UHF 2-way radio transceiver that has these eight frequencies installed: 462.550, 462.725, 462.5875, 462.6125, 462.6375, 462.675, 462.6625 and 462.6875 MHz. This one watt radio comes with flexible rubber antenna, rechargeable ni-cad battery, AC adapter/charger, belt clip, F.C.C. license application and more.

NEW! Uniden GMR100-F GMRS Handheld	$159.95
NEW! Uniden GRANTXL-F SSB CB Mobile	$149.95
NEW! Uniden PC76XL-F CB Mobile	$99.95
NEW! PRO320XL-F CB Handheld/Mobile	$69.95
Uniden PRO330E-F CB Remote	$99.95
Uniden PC122-F SSB CB Mobile	$107.95
Uniden PC66A-F CB Mobile	$78.95
Uniden PRO510XL-F CB Mobile	$36.95
Uniden PRO520XL-F CB Mobile	$49.95
Uniden PRO538W-F CB & Weather	$69.95

Shortwave

ICOM R1-F ultra compact handheld	$459.95
ICOM R100-F mobile	$629.95
ICOM R71A-F base (add $39.00 shipping)	$1,029.95
ICOM R72A-F base (add $39.00 shipping)	$944.95
ICOM R7000-F base (add $39.00 shipping)	$1,199.95
ICOM R7100-F base (add $39.00 shipping)	$1,259.95
ICOM R9000-F base (add $89.00 shipping)	$4,934.95
Grundig Satellit 700-F portable with AC adapter	$459.95
Grundig Satellit 500-F portable with AC adapter	$359.95
Grundig Cosmopolit-F with cassette recorder	$179.95
Grundig Yacht Boy 230-F portable	$139.95
Grundig Traveller 2-F portable	$79.95
Sangean ATS606-F ultra compact	$149.95
Sangean ATS606P-F radio with antenna & AC adapter	$169.95
Sangean ATS800-F portable	$79.95
Sangean ATS803A-F portable with AC adapter	$159.95
Sangean ATS808-F portable	$159.95
Sangean ATS818-F portable without cassette recorder	$189.95
Sangean ATS818CS-F with cassette recorder	$209.95
Sangean ANT60-F portable shortwave antenna	$9.95

Weather Stations

Public safety agencies responding to hazardous materials incidents must have accurate, up-to-date weather information. The Davis Weather Monitor II is our top-of-the-line weather station which combines essential weather monitoring functions into one incredible package. Glance at the display, and see wind direction and wind speed on the compass rose. Check the barometric trend arrow to see if the pressure is rising or falling. Our package deal includes the new high resolution 1/100 inch rain collector part **#7852-F**, and the external temperature/humidity sensor, part **#7859-F**. The package deal is order **#DAVI-F** for $524.95 plus $15.00 shipping. If you have a personal computer, when you order the optional Weatherlink computer software for $149.95, you'll have a powerful computerized weather station at an incredible price. For the IBM PC or equivalent order part **#7862-F**. For Apple Mac Plus or higher including Quadra or PowerBook, order part **#7866-F**.

Other neat stuff

ICOM GP22-F Global Positioning System	$739.95
WR200-F Weather Radio with storm alert	$39.95
RELM RH256NB-F VHF synthesized transceiver	$289.95
Ranger RCI2950-F 25 watt 10 meter ham radio	$244.95
Ranger RCI2970-F 100 watt 10 meter ham radio	$369.95
Uniden LRD9000W-F Laser/Radar Detector	$159.95
PWB-F Passport to Worldband Radio by IBS	$12.95
LIN-F Latest Intelligence by James Tunnell	$12.95
NPD-F Uniden National Police Directory	$12.95
FBE-F Uniden Eastern Frequency Directory	$12.95
FBW-F Uniden Western Frequency Directory	$12.95

Buy with confidence

It's easy to order from CEI. **Mail orders to:** Communications Electronics Inc., Emergency Operations Center, P.O. Box 1045, Ann Arbor, Michigan 48106 U.S.A. Add $15.00 per radio for U.P.S. ground shipping and handling in the continental U.S.A unless otherwise stated. Add $6.00 shipping for all accessories and publications. Add $6.00 shipping per antenna. For Canada, Puerto Rico, Hawaii, Alaska, P.O. Box, or APO/FPO delivery, shipping charges are two times continental U.S. rates. Michigan residents add state sales tax. No COD's. 10% surcharge for net 10 billing to qualified accounts. All sales are subject to availability, acceptance and verification. Prices, terms and specifications are subject to change without notice. We welcome your Discover, Visa, American Express or MasterCard. Order toll-free by calling 1-800-USA-SCAN. For information or if outside the U.S.A. call 313-996-8888. FAX anytime, dial 313-663-8888. Order your electronic equipment from Communications Electronics Inc. today.

Scanner Distribution Center and CEI logos are trademarks of Communications Electronics Inc.
Sale dates 9/1/93 - 1/2/94 AD #080793GEN Copyright © 1993 Communications Electronics Inc.

For credit card orders call

1-800-USA-SCAN

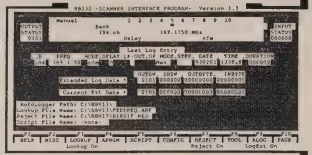
Communications Electronics Inc.
Emergency Operations Center

P.O. Box 1045, Ann Arbor, Michigan 48106-1045 U.S.A.
For information call 313-996-8888 or FAX 313-663-8888

The HB-232

SCANNER/COMPUTER INTERFACE ..... For .....

PRO-2004
PRO-2005
PRO-2006
PRO-43
more soon!



REVOLUTIONIZES THE ART, SCIENCE & PLEASURE OF SCANNING!

The HB-232 is the long awaited RS-232 scanner controller and data acquisition system brought to you by *Bill Cheek*, author of the *Scanner Modification Handbooks*.

The HB-232 Scanner/Computer Interface Kit + includes:

- printed circuit board and essential electronic parts
- Control Program on Disk (specify disk size)
- detailed documentation & photos on assembly, installation & operation
- wide area network technical support

+ Requires PC/XT/AT/clone w/MS-DOS 3.1 or higher & 512-K RAM min; HD recommended.

Designed for the PRO-2004/5/6 scanner series, the HB-232 features AutoLog, AutoProgram, Data LookUp, Scripts & much more with nearly unlimited variations of computer control & data collection from the scanner. Facilitates maximum performance *without* compromise. Easy to install & use; minimal invasion to scanner! Discover a new dimension of radio scanning! Order today! **$194.95 + $5 S&H, ck, m.o.** MC/VISA.

SASE for more info.

* Reduced capability for PRO-43

COMMtronics Engineering
P.O. Box 262478-P
San Diego, CA 92196-2478
(619) 578-9247
1:30pm-5:30pm, PST: Voice Only
6:00pm-1:00pm, PST: BBS & FAX Only

CIRCLE 56 ON READER SERVICE CARD

16138.0: BZR66, Xinhua, Yuryumqi, China, w/nx at 1328, 75 baud. (Boender, NLD).

16203.0: RCF, MFA, Kupavna, Russia, w/continuous RYRY w/o ID, 425/75 at 1435, foll at 1440 w/CQ CQ CQ de RCF & RYRY. At 1443: "QRU SK GA" then went QRT. (Ed.)

16987.0: GYU, Royal Navy, Gibraltar, w/available channels list, 850/75 at 1843. (Ed.)

17018.0: EBA, Madrid Navrad, Spain, w/navareas, 170/75 at 1840. (Hetherington, Fla.)

17020.0: UDK2, Murmansk R., Russia, w/tfc at 1334, 50 baud. (Boender, NLD)

17135.0: UJQ, Kiev R., Ukraine, w/tfc for UDTI, ship Sovietskaia Oukraina, 50 baud at 1341. (Boender, NLD)

17140.0: UMN7, Murmansk R., Russia, w /RYRY & telegram tfc, 170/50, 1503-1522. (Ed.)

17215.4: LOR, Puerto Belgrano Navrad, Argentina, w/marine wx in SS, 425/75 at 0030. (Hetherington, Fla.)

17432.0: DFZG, MFA, Belgrade, Yugoslavia, w/RYRY at 1400 .(Boender, NLD), & w/Tanjug nx in EE, at 1534, 425/75. (Ed.).

17441.3: 5YE, Nairobi Meteo, Kenya, w/coded wx, 850/100 at 0030. (Ed.)

17474.0: "V5G," MFA, Bucharest, Romania, w/encryption at 1537, ROU-FEC/164.5. (Ed.)

17550.8: RFTJ, French Navy, Dakar, Senegal, w/5L msgs to Paris, ARQ-E3/192 at 1630. (Ed.)

18173.5: STK, Khartoum Air, Sudan, w/RYRY, 50 baud at 2350. ("Bunky," Ill.)

18230.0: GFL25, Bracknell Meteo, England, w/coded wx, 425/50 at 1400. (Ed.)

18264.8: CNM78, MAP, Tanger, Morocco, w/nx in FF, 372/50 at 1638. (Hall, RSA)

18320.0: Un-ID w/5F grps, 425/100 at 1535. (Ed.)

18336.7: NMF, USCG, Boston, Mass., w/unclas tfc to NRCB, cutter "Eagle," ARQ 1545-1620. (Ed.)

18416.7: MFA, Jakarta, Indonesia, w/nx in Indonesian at 1201, 430/50. (Hall, RSA)

18450.0: Un-ID w/5L grps, 425/75 at 1459, foll by QRU SK QRU SK at 1500. (Ed.)

18593.0: CLP12, Cuban Emb., Lima, Peru, w/5F msgs, 425/75 at 1616. (Ed.)

18648.5: SOT265B, PAP, Warsaw, Poland, w/nx in Polish, FEC at 1406. (Ed.)

18702.3: DFS70, PIAB, Bonames, Germany, w/nx in GG at 1900, FEC-A/96. (Ed.)

18872.0: BZR68, Xinhua, Yuryumqi, China, w/nx in EE, 425/75 at 1241. (Ed.)

19067.4: CLP1, MFA, Havana, Cuba, w/5F grps to Congo at 2125, 50 baud. ("Bunky," Ill.)

19086.8: CLP1 w/prensaminrex, 50 baud at 2128. ("Bunky," Ill.)

19117.5: MFA, Jakarta, Indonesia, w/tfc at 1349, FEC-S/96. (Ed.)

19418.5: RFFA, Mindefense, Paris, France, w/nx re French Polynesia, ARQ-E3/192 at 1130. (Ed.)

19693.0: URD, St. Petersburg R., Russia, w/msgs to ship c/s URFV, ARQ at 1647. (Ed.)

19718.0: UDK2, Murmansk R., Russia, w/marine info in RR, 170/50 at 1315. (Manthey, N.Y.)

20133.5: DFZG, MFA, Belgrade, Yugoslavia, w/nx in SC, 425/75 at 1717. (Ed.)

22378.1: FTT91, St. Lys R., France, w/a marine msg & tfc list, FEC at 1206. (Hall, RSA)

22960.0: HBD20, MFA, Berne, Switzerland, w/msgs in GG, ARQ at 1525. (Manthey, N.Y.)

23052.4: CLP45, Cuban Emb., Luanda, Angola, w/RYRY, 425/75 at 1625. (Manthey, N.Y.)

23273.0: IPG20, MFA, Rome, Italy, w/2 5L msgs to Buenos Aires, Argentina & a circular re an inquiry by Scotland Yard into the alleged execution of a British soldier in Argentina during the Falkland Islands war 10 years ago. Was ARQ-E/96 at 1531. (Ed.)

23358.5: RFFA, Mindefense, Paris, France, w/ 5L grps & msgs at 1555, ARQ-E3/192. (Manthey, NY)

23387.5: LOR, Puerto Belgrano Navrad, Argentina, w/wx & radioadvisories at 1920, 170/75. (Hetherington, Fla.)

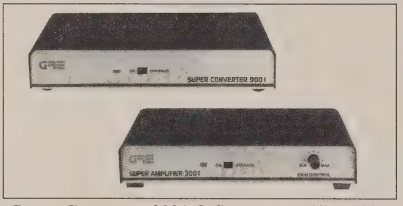
24300.0: AFS, Offutt AFB, Elkhorn, Nebr., w/KAWN wx data, 75 baud at 1500. ("Bunky," Ill.)

25030: FDY, French Air Force, Orleans, France, w/le bricks & RYRY, 400/50 at 1500. (Manthey, N.Y.)

25136.0: Un-ID w/encrypted msgs & RYRY,

Improve Your Scanning Coverage!

GRE America is proud to introduce a new family of products to enhance your scanning pleasure! First, GRE has designed the new **Super Converter 9001** for base model scanners. The 9001 converts 810 MHz - 950 MHz down to 410 MHz - 550 MHz. The 9001 is the perfect alternative to buying a new, expensive scanner covering the 800 MHz band. Next, GRE announces the new **Super Amplifier 3001** for base model scanners. The 3001 will increase gain by as much as 20 dB, and is engineered to help scanners with low sensitivity pull in weak signals. Both products use BNC connectors, (1) 9 volt battery and have an off/pass switch for returning to normal operation.



Super Converter 9001 & Super Amplifier 3001

Super Converter II

Super Amplifier

All-Band Antenna

U.S. & International Distributorship inquiries welcome. Please call GRE for further information!

Let GRE Manufacture Your Radio Products!

GRE America, Inc. is a leading OEM developer and manufacturer of radio telecommunications products such as:

● Cordless Telephones ● CB & Marine Radios ● Spread Spectrum "engines" ● Remote Monitoring Systems

If you need a high quality, cost competitive, reliable manufacturer, GRE will provide you with a free production quotation. ***For more information, please call GRE at (800) 233-5973.*** GRE is a subsidiary of General Research of Electronics, Inc.

GRE America, Inc.

GRE America, Inc.
425 Harbor Blvd., Belmont, California 94002
(415) 591-1400 Outside California: (800) 233-5973

CIRCLE 64 ON READER SERVICE CARD

HOW I GOT STARTED

Popular Communications invites readers to submit, in approximately 150 words (more or less), how they got started in the communications hobby. They should preferably be typewritten, or otherwise easily readable. If possible, a photo of the submitter should be included.

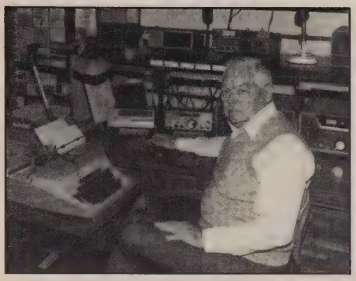
Each month we will select one entry and run it here. You need submit your entry only once, we'll keep it on file. All submissions become the property of *Popular Communications*, and none can be acknowledged or returned. Entries will be selected for use taking into consideration if the story they relate is especially interesting, unusual, or even humorous. We reserve the right to edit all material for length and grammar, and to improve style.

The person whose entry is selected will receive a one-year gift subscription (or one-year subscription extension) to *Popular Communications*.

Address all entries to: How I Got Started, Popular Communications, 76 North Broadway, Hicksville, NY 11801.

Our October Winner

This month our winner is Peter T. Hulth, Jr., N4SXG, of Smithfield, N.C. Peter told us:



Peter T. Hulth, Jr., N4SXG, is active in various ham radio organizations and traffic handling networks.

"In 1936, when I wasn't quite 13, my radio hobby began. That's when my friend and I built a crystal radio. The crystal cost us a dime. We wound the coil from transformer wire around a 5-in. length of broom handle, using a piece of spring brass as a slider to (theoretically, at least) change the wavelength. A clothesline served as the antenna, and we were able to pick up the 40 meter ham band.

"When I entered the U.S. Navy in 1941, I exaggerated and said I was very deeply involved in the radio hobby. That earned me a five month course at the Navy's school. There were two years of combat communications service in the Amphibious forces that included landings in southern France and Okinawa. Later, when the Korean War erupted, I served in the Navy for an additional two years.

"Since 1944, I have taught hundreds of people Morse Code, in the Navy, as well as in Civil Defense, Boy Scouts, and ham radio classes.

"In 1986, as a feature writer for the *Smithfield Herald*, I suggested to the editors that I might do a story about ham radio in our community. They agreed, and I interviewed the instructor of a ham radio class, also his pre-teen student. This was a course sponsored by the Johnston County Amateur Radio Society, Benson, N.C.

"At the class I attended for the purpose of snapping photos for my story, the instructor knew of my background in radio and suggested that I take the Novice code and written tests. I passed the Novice requirements. Since then, I have obtained my General Class ticket, and am active on the 2, 10, 15, 20, 40, and 80 meter bands. I am also Registered Monitor KNC4CP."

"It took me 50 years in radio to realize it was time to get my ham ticket!" ■

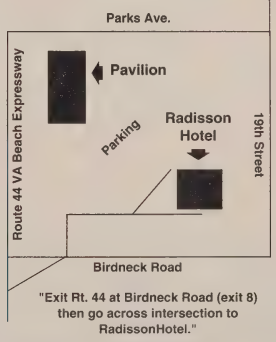
POPULAR COMMUNICATIONS WORLDWIDE SWL CONFERENCE

Popular Communications

Worldwide SWL Conference!

October 2-3, 1993

Hurry, Time Is Running Out!



"Exit Rt. 44 at Birdneck Road (exit 8) then go across intersection to RadissonHotel."

*** Meet major SW broadcasters**

*** EXPERT Speakers on Current topics include:**

Gerry Dexter, Bill Price, Dr. Harold Cones, Dick Robinson, Pat Murphy, Don Dickerson and Ian McFarland, PLUS . . . Speakers from the VOA, BBC and more!!!

PLUS – Speakers from the VOA, BBC and more!!!

Our KEYNOTE SPEAKER, Roy Neal, K6DUE, will talk about SAREX (Shuttle Amateur Radio Experiment) and Tuning the Space Shuttle Comms. He's the Chairman of SAREX, for ARRL-AMSAT and former NBC News Correspondent.

Dozens of manufacturers and dealers of SWL and amateur radio equipment will be on hand demonstrating their equipment and ready to answer your questions on the spot -- including -- Kenwood, Yaesu, JRC and more!

The SWL Conference will be held in conjunction with the **18th Annual Virginia Beach Hamfest and Computer Fair** (the areas LARGEST hamfest and computer exhibit). The first Popular Communications Worldwide SWL Conference,held at the Radisson Hotel, Virginia Beach, Virginia has something for everyone!

Make Plans Now to attend both days – October 2 - 3, 1993 at the Virginia Beach Pavilion; minutes from the beach, Navy bases and historic sites!

Radisson Hotel is across parking lot from Pavilion. You can walk between both!

"Talk-in frequency 146.970 MHz."

To acquire room reservations at the Radisson Hotel Virginia Beach call 1-800-333-3333 and ask for Virginia Beach Hamfest rates.

Each Ticket is $25 payable by check, money order, Mastercard, VISA, AMEX, Discover

(Pick up tickets and info. pack at the Radisson Hotel on October 1 between 2 and 8 p.m.)

Mail your order to:

Popular Communications, 76 North Broadway, Hicksville, NY 11801 Telephone 516 681-2922; FAX 516 681-2926

LISTENING POST

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

This is one of those months when there's no obvious place to begin, no item that jumps up and screams "me first!" So let's just step back a few paces and throw a dart at the world map on the shack wall and see what we hit.

Australia? Good enough. You can now hear broadcasts of Australian Armed Forces Radio. They're being carried on shortwave for Australian service personnel in both Somalia and Cambodia. The broadcasts for Somalia come from a transmitter at Exmouth in northwest Australia at 0300 on 19037.5, 0900 on 25322.5 and 1400 on 13508.5, all upper sideband. A transmitter at Canberra is used for broadcasts to Cambodia at 0300 on 23678.5, 0900 on 20418.5 and 1200 on 12070.5, all upper sideband. In both cases the program is one hour long, with the first broadcast repeated for the rest of the day.

Adventist World Radio has announced the availability of a glossy, full color QSL card being issued for reception of AWR broadcasts via Russia. Reports go to AWR-Europe, Box 383, I-47100 Forli, Italy. You can listen for another AWR outlet–Adventist World Radio–Africa, which is beamed to west Africa via Africa Number One in Gabon and is on the air daily in French from 1700 to 1800 on 9625 and on Sundays with English at 1200 on 17890.

The new Voice of America relay station at Udorn, Thailand is being jammed by mainland China. 11785 is being particularly hard hit. By now the VOA should have a second transmitter in operation from Thailand.

Incidentally, the planned VOA relay from Israel has been cancelled by the Clinton administration, but the Kuwait and Sao Tome relay bases are still on.

Every month it seems we hear about another shortwave broadcaster that's just felt the ground tremble under its feet.

In the past few weeks the government of Sweden cut the budget of Radio Sweden by a full one-third. The word is that Radio Sweden will drop broadcasts in both Spanish and French and discontinue its own programs in Swedish, relying instead on relaying the home service.

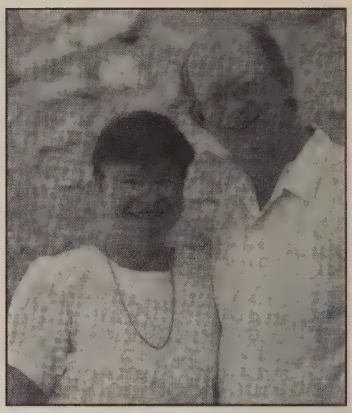
U.S. religious broadcaster KCBI, Dallas, is also having problems and the station may well be off the air by the time you read this, for reason or reasons which haven't been announced. KCBI has a troubled history. Its first effort was short lived and was followed by years of silence. The station was finally purchased by a new group and it returned to the air only last year.

Spain's Costa Rican relay (at Cariari de Pococi) should have its Ibero-American Service in full bloom by now, running 12 hours per day and beamed to the US, the Caribbean, Central and South America, all in Spanish. The programming is largely news, with an emphasis on Western Hemisphere events. Main frequencies are 5970, 9630, 9740, 11815, 11880, 15125, 17870 and 17890 at various hours between 1100 and 0400.

Radio Sofia has followed in the footsteps of stations in most of the former communist nations. It has dropped its old name and now uses Radio Bulgaria.

Watch for the return of longtime religious broadcaster ELWA, which was destroyed in the Liberian civil war. The station plans to resume, using a 20 kw transmitter and may even open up a second station in another African country sometime in the future.

The former clandestine station Radio Miskut is now a legitimate Nicaraguan broadcaster and has returned to shortwave.



TWR Bonaire's Chuck Roswell, hosted the station's DX program. He and his wife, Barbara, will transfer to TWR's station in Monaco.

It's being noted on 5770, in Spanish, running a schedule that sometimes ends as early as 2320 or runs as late as 0205.

The broadcasts are in upper sideband.

NOTES FROM THE MAIL–Larry Zamora sends what he terms a "pseudo QSL" he clipped from Deutsche Welle's 1993 calendar.

Larry says the card notes that DW began in 1953 using a single 20 kw transmitter broadcasting only in German. Today DW uses 35 languages on a total of 43 transmitters. Thanks, Larry. And congratulations to Deutsche Welle, celebrating its 40th anniversary this year.

Jill Dybka in Tennessee sends a note

Here's "Col. DX," aka R.C. Watts in his Louisville, Kentucky DX shack

Germany's Deutsche Welle celebrates 40 years of shortwave broadcasting this year.

saying she got a good response from normally hard-to-QSL Radio Pyongyang. The package included an LP record and two books. Her report was sent to her brother in England who then mailed it to the station, a technique which usually works with this station. As for getting replies out of the BBC, Spain, Egypt and South Africa...the BBC doesn't really QSL reports. The others just take time, and perhaps a second try.

Let's have your input! Shortwave loggings should be arranged by country, be double spaced and must—repeat, must—include your last name and state abbreviation after each. Open arms will also welcome your shack photos, station photos and spare QSLs we can use as illustrations as well as program schedules, station background information, news clippings, letters and whatever else you'd care to share!

Here are this month's logs. Remember, all times are in UTC, which is 5 hours ahead of EST (0000 UTC = 7pm EST). Broadcast language is assumed to be English unless specified otherwise (SS = Spanish, RR = Russian, FF = French, etc.)

Listening Post reporter Jill Dybka of Nashville, TN, here with 1969 VW Beetle and DX-440 of unspecified vintage.

Loggings

ANTIGUA–BBC relay, 15220 at 1235 with interview. (Pappas, SD)

ARGENTINA–RAE heard on 11710 at 0220 with news. (Sooy, NJ)

ASCENSION ISLAND–BBC relay on 15260 at 1650. (Low, TX)

AUSTRALIA–Radio Australia, 9510 in CC at 1011 with EE lessons. Also 15240 at 0400 and 15365//17715 at 0342 with an interview. (Lamb, NY) 17795 at 0410. (Seefeldt, WI) Here and //21740 at 0236. (Low, TX)

ABC, Brisbane, 4920 at 1052 with big bands and ABC news.

9660 at 0700 with ABC news. (Lamb, NY)

ABC, Perth, 6140//9610 at 1133 with old pop music, ABC news, promo for ABC Regional Radio. (Lamb, NY)

AUSTRIA–Radio Austria International, 6015 (via Canada) at 0523 in GG and EE, frequency announcement at 0530. (Sooy, NJ) 0530 with plans for the country's 1,000 birthday celebration. (Pellicciari, CT)

BELGIUM–Radio Vlaanderen Int'l, 15540 at 1756 with IS, ID "Brussels Calling". (Lamb, NY)

BOLIVIA–Radio Santa Ana, 4649 at 2342 with ID, time checks, announcements, all SS. (Rausch, NJ)

Radio Frontera, 4450 at 0930 with ID and into SS music. (Rausch, NJ)

Radio Metropolitana, 6195 at 0933 in SS with echo announcements, medium wave frequency announcement, Bolivian folk and Latin pops. (Lamb, NY)

BOTSWANA–VOA relay on 7265 at 0440. (Rogen, WA) New 12080

at 0503 with business report. (Lamb, NY)

BRAZIL–Radiobras, 15445 at 1229 with special program on next day's elections, songs, IDs, "Girl From Ipanema" at sign off. (Pappas, SD)

Radio Educadora Rural, 4755 at 0145 in PP with ID, mention of Campo Grande. Heard in SS, not Portuguese. (Rausch, NJ)

Radio Cultura Sao Paulo, 9615//17815 at 0041 in PP with Brazilian tunes. (Lamb, NY)

Swiss Radio Int'l relay, 17730 at 0009 with "Dateline" and site ID. (Lamb, NY)

Radio Cancao Nova, 4825//6105//9675 at 0632 in PP with religion, ID, address and "Madrugada" religious program. (Lamb, NY)

BULGARIA–Radio Bulgaria (new name) 11720//15330 at 0038 with economic and sports programs. (Lamb, NY) 15330 at 2030; 2209. (Pellicciari, CT; Rogen, WA)

CANADA–CFRX relaying CFRB, Toronto, 6070 with news at 1730. (Seefeldt, WI)

CKZN, St. John's 6160 at 2119 with CBC children's show. (Lamb, NY)

CHAD–4905 at 0429 with flute-like music, anthem, man in FF and into African language. Possible Chad. (Sooy, NJ) (Would seem so, editor)

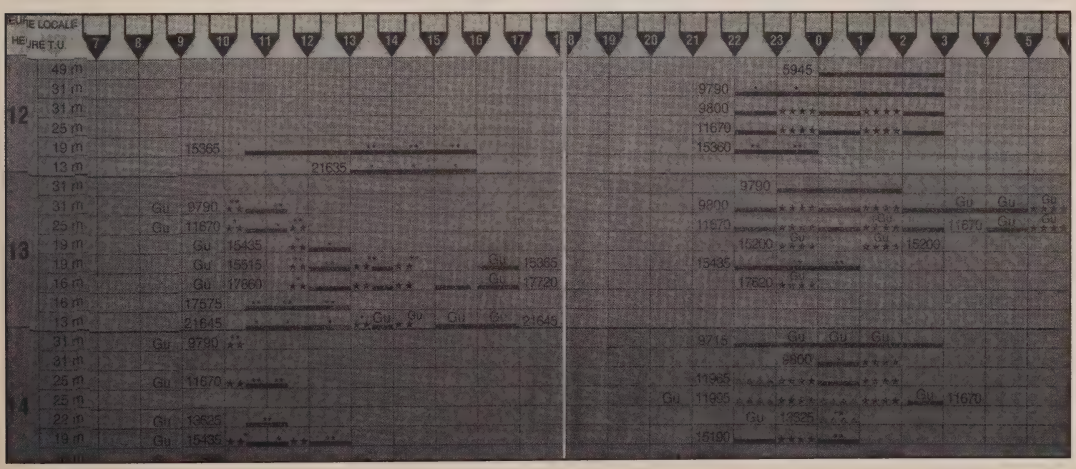
CHINA–China Radio Int'l, 9690 (via Spain) at 0330 to close at 0356. (Sooy, NJ) 11855 at 1323 with news features. (Zamora, CA) 15210 at 1242 about Chinese musical instruments. (Foss, AK)

CPBS, 15880 at 0624 in CC with vocals. (Foss, AK)

COLOMBIA–Caracol Bogota, 5075 in SS with news, IDs, promos, commercials, music at 0247; 0402; 0735. (Lamb, NY; Sooy, NJ; Pellicciari, CT)

Ondas de Orteguaza, 4975.8 at 1000 sign on in SS with ID "Ondas del Ortgeguaza transmito en banda tropical.." (Rausch, NJ)

CONGO–RTV Congolaise, 7105 at 0503 with



The RFI schedule of broadcasts beamed to the Americas.

man and woman with news in FF, lost in QRM at 0530. (Sooy, NJ) 0641 with uptempo jazz and FF announcer. (Foss, AK)

COSTA RICA–Radio For Peace Int'l, 15030 at 0257 with ID and program about self sufficiency in food production. (Sooy, NJ)

Adventist World Radio/TIAWR, 13750 at 0506 with IS til EE/SS ID at 0520, anthem and into EE program, but then "La Vie Abundant" program in French! (Lamb, NY)

CROATIA–Croatian Radio, 13830 at 2009 in Croatian with easy listening music, EE news at 2102, a new time. (Lamb, NY)

CUBA–Radio Havana, 6010 at 0228 with chimes and ID by woman at 0229. 9655 at 0415 with news. (Sooy, NJ) 9510 at 0600. (Pellicciari, CT)

Radio Rebelde, 3365 in SS at 0415 with news. (Sooy, NJ)

CZECH REPUBLIC–Radio Prague, 7345 at 2358 with IS, ID, EE news and "Off The Wall" program. Also new 15606 at 1659 with IS, ID, news, Czech jazz. (Lamb, NY)

DENMARK–Radio Denmark, via Norway, 9560 at 0430 with chimes, EE ID. (Sooy, NJ) 15165/ /15175 at 2130 sign on with EE ID, then into Danish. (Vaage, CA)

ECUADOR–HCJB, 9745 at 0100 with "Ham Radio Today". (Seefeldt, WI) 11925 at 0502 and 15155 at 0231, both times with news. (Sooy, NJ) 11790//21455USB//21480 at 2133 with "Blues, Rags and All That Jazz." (Lamb, NY)

EGYPT–Radio Cairo, 12050 in AA at 2141. (Low, TX)

ENGLAND–BBC, 3955 at 0458, 5975 (via Antigua) at 0450 and 9410 at 0211, all with news. 11920 at 0246 with Swahili into slow English. (Sooy, NJ) 9515 (via Canada) at 1408 with soccer and 11750 (via Singapore) at 1430 with "Anything Goes". (Zamora, CA) 9915 at 0306. (low, TX) 11955 at 0009. (Vaage, CA) 15070 at 2000. (Pellicciari, CT)

FINLAND–Radio Finland Int'l, 15185 at 0156. (Foss, AK)

FRANCE–Radio France Int'l, 21580//21620/ /21635 in FF at 1312. (Low, TX)

FRENCH GUIANA–Radio France Int'l relay, 11670 at 0444 with news in FF. (Sooy, NJ) 21645 in FF at 1342. (Low, TX)

RFO Guyane, 5055 in FF at 0802 with news, country, comedy and laughter. (Lamb, NY)

GERMANY–Deutsche Welle, 6025, possibly via Canada, at 0400 with AA/GG ID. Also 9545 at 0303 with EE news. (Sooy, NJ) 17860 at 2104 in GG. (Vaage, CA) 21540//21560 in GG at 1310. (Low, TX)

GHANA–GBC-1, 4915 at 0600 with news in EE. (Pellicciari, CT)

GREECE–Voice of Greece with news in EE at 1529 and Swedish at 1540 on 15630//15650//17525. (Pappas, SD)

RS Makedonias, 9935//11595 at 0514 in Greek, playing jazz, then ID and religious service. (Lamb, NY)

VOA Kavala relay on 9700 at 2008 with Willis Conover. (Lamb, NY)

GUAM–KTWR on 11805 at 0900 with IS, ID and "Plain Truth" program, targeted to Papua New Guinea. (Rausch, NJ)

KSDA on 13720 at 1716 with radio drama and music. (Pappas, SD)

GUINEA–RTV Guineenne, 7125 at 0630 in FF with ID, news, talks, music. (Pellicciari, CT)

HAWAII–WWVH, 10000 at 0600, woman with time announcement. (Seefeldt, WI)

HUNGARY–Radio Budapest, 9835 at 0333 with sports news, ID. (Sooy, NJ)

ICELAND–INBS, 13855 at 1948 in Icelandic. (Foss, AK)

INDONESIA–Radio Republik Indonesia at Kenari, Sulawesi on 4000.2 at 1026 with native choirs. (Foss, AK)

ISRAEL–Kol Israel, 9435 at 0421 with news in FF, weather, ID, Israeli pops. (Lamb, NY)

ITALY–RAI feeder, 10234USB at 0407, Italian, "Radio Due" ID, news, Handel's "Largo." (Lamb, NY)

JAPAN–Radio Japan, 5960 via Canada, 0112 with "Hello From Tokyo" announcement. (Seefeldt, WI) 11735 via Canada with news at 1400 and 17810 with mailbag at 2324. (Zamora, CA) 11860 at 0559. (Vaage, CA) 11865 at 1550. (Rogern, WA) 17810 at 0530. (Foss, AK)

Radio Aum Shinriyko, 9865 via Radio Moscow at 0420. Heavy accent. (Sooy, NJ)

KUWAIT–Radio Kuwait, 15605 at 0120 in AA with Kuwaiti and pop music, IDs, radio play, off 0200. (Lamb, NY)

LESOTHO–Radio Lesotho, 4800 at 0345 with ID, talk in local language, EE ID and news at 0500. (Rausch, NJ) 0504 with news and a few commercials, 0507 music, then into an African language. (Zamora, CA)

Abbreviations Used in Listening Post

AA	**Arabic**
BC	**Broadcasting**
CC	**Chinese**
EE	**English**
FF	**French**
GG	**German**
ID	**Identification**
IS	**Interval Signal**
JJ	**Japanese**
mx	**Music**
NA	**North America**
nx	**News**
OM	**Male**
pgm	**Program**
PP	**Portuguese**
RR	**Russian**
rx	**Religion/ious**
SA	**South America/n**
SS	**Spanish**
UTC	**Coordinated Universal Time (ex-GMT)**
v	**Frequency varies**
w/	**With**
WX	**Weather**
YL	**Female**
//	**Parallel Frequencies**

ICOM™ IC-R7100
Sweeping 1800 Channels/Minute

DELTACOMM™ I-7100 communication manager and your MS-DOS computer gives you a custom interface integrated with optimized software that will not just control but will maximize the potential of your R7100. Here are a few (there are many more) examples of the advanced features DELTACOMM™ I-7100 has to offer.

- DELTACOMM™ I-7100 CYBERSCAN feature for monitoring systems employing cluster or frequency hopping techniques.
- Individually programmable database volume levels (by channel) while scanning.
- Spectrum log function will sweep a frequency spectrum, generate a histogram and log frequency/activity to screen and/or disk in real time.

- Dual squelch detect electronics integrated with DELTACOMM™ I-7100 software guarantees optimum speed and performance during a frequency search or database scan.
- Programmable signal strength threshold limits with full 8-bit accuracy allow selective monitoring and logging. Only stations having signal strength less than or greater than or within upper/lower user defined signal strength window limits will be monitored and/or logged.
- Continously updating activity information window displays the last 19 active channels.
- Channel activity status is displayed in real time with activity log function. To determine system loading when first 5 channels are simultaneously busy, "All Trunks Busy" message is logged to disk.
- Receiver characterization with DELTACOMM™ I-7100 birdie log function automatically logs any receiver birdies prior to a frequency search operation. Birdie channels are then locked out during a frequency search operation, thus eliminating false channel logging.
- Custom interface allows selective program control of relay contact. Possible uses include activating an operator alert, switching antennas via coax relay or turning on a tape recorder when user defined frequencies are found to be active.

DELTACOMM™ I-7100 communication manager comes complete with Delta Research custom (CI-V) communication interface, UL listed power supply, manual and receiver interface cable for $349.00 + $8.00 (U.S.) or $25.00 (foreign) S&H. Contact us for additional information on DELTACOMM™ communication managers for ICOM™ R7000, R71A, R72 and IC735. Performance is proportional to video card, type of computer and receiver squelch detection method.

MasterCard **Delta Research** AMERICAN EXPRESS

Box 13677 • Wauwatosa, WI 53213 • FAX/Phone (414) 353-4567

CIRCLE 62 ON READER SERVICE CARD

Why buy a TNC?
PC HF FAX + PC SWL $179.00

SPECIAL COMBINATION OFFER

For a limited time, if you order PC HF FAX $99 (see our other ad in this issue), you can add our new and improved PC SWL 3.0 for $80.00 instead of our regular low price of $99.00.

PC SWL contains the hardware, software, instructions and frequency lists needed to allow you to receive a vast variety of digital broadcasts transmitted over shortwave radio. All you need is any IBM PC or compatible computer and an SSB shortwave receiver. The product consists of:

Demodulator
Digital Signal Processing Software
200 Page Tutorial Reference Manual
World wide Utility Frequency List
Tutorial Audio Cassette with Samples

PC SWL automatically decodes Morse code, Radio Teletype, FEC (forward error correcting code), SELCAL (selective calling transmissions), and NAVTEX.

PC SWL lets you tune in on world press services with up to the minute news, meteorological broadcasts, ham radio operators, coastal shore stations, aviation telex and much more digital action on the shortwave bands. Find all the utility station action you have been missing. PC SWL software uses the processor in your PC to do the work, why pay for another expensive box when a simple interface and your PC can do the job?

ADVANCED FEATURES:

Tuning Oscilloscope
Digital Waveform Presentations
Auto Calibration and Code Recognition
Continuously Tunable Filter Frequencies
Variable Shift
Adjustable CW Filter Sensitivity
Unattended Capture and Printing
Integrated Text Editor
Integrated Log and Database
Shell to DOS applications
RTTY/NAVTEX Background Operation
Seamless Integration with PC HF Facsimile

Call or write for our complete catalog of products. Visa & MasterCard welcome.

Software Systems Consulting
615 S. El Camino Real, San Clemente, CA 92672
Tel:(714)498-5784 Fax:(714)498-0568

CIRCLE 93 ON READER SERVICE CARD

BBC Lesotho, 3255, weak at 03330. (Rausch, NJ)

MALAYSIA–Voice of Malaysia at Kajang on 6100 at 1255 with IS, sign on in Malayan language at 1300. (Zamora, CA)

MONACO–Radio Monte Carlo, via Canada, on 9760 at 0436, in AA with singing prayers, into EE at 0445.

MOROCCO–VOA Tangier relay on 15205 at 1606 with ID and news. (Lamb, NY)

RTV Morocco, 17595 at 1448 with EE with "Wind and Weather" feature. (Lamb, NY)

MEXICO–Radio Educacion, 6185 at 0600 in SS. (Pellicciari, CT)

MONGOLIA–Radio Ulan Bator, 12015 at 1220 in Mongolian. (Northrup, MO) 0927 in EE with Mongolian music. (Foss, AK)

NEW ZEALAND–Radio New Zealand, Int'l, 9700 at 0630 with early opening for rugby coverage. Gave sked as 1650-1850 on 6035; 1850-2140 on 11735; 2140-0700 on 15120 and 0700-1200 on 9700. (Rausch, NJ) 15120 with entertainment news. (Zamora, CA) 0420 with music. (Rogen, WA)

NETHERLANDS–Radio Netherlands, 11950 at 2127 with IS and into Dutch at 2130. (Low, TX) 17610 at 1435 with news. (Lamb, NY)

NETHERLANDS ANTILLES–Radio Netherlands relay, 11720 at 0425 with sign off. (Sooy, NJ)

NIGERIA–Voice of Nigeria, at 0500 with ID, African music. (Sooy, NJ) 0530 with news, "Wheels of Progress." (Pellicciari, CT)

NORTH KOREA–Radio Pyongyang, 6576 at 1100 with news, choral music, political programs. (Pappas, SD) 7580 at 1109 in JJ. (Foss, AK) 11335 at 1215. (Northrup, MO) 13650 at 2306. (Rogen, WA)

Korean Central Broadcasting Station, 2850 at 1019 with Korean music and KK. (Foss, AK)

NORTHERN MARIANAS–KHBI, 9425 at 1335. (Low, TX) 9530//13625 at 1448 with sports, letters. Also on 11580 at 1600. (Pappas, SD)

KFBS, 9465 at 1927 with music in RR, EE ID at 1930. (Foss, AK)

NORWAY–Radio Norway Int'l, 9560 at 0400 with news in Norwegian. (Sooy, NJ) 15165 at 2101 with news in NN. Also 15175 at 2105 with sports in NN. (Vaage, CA)

OMAN–BBC relay, 11955 at 0401 with news, ID 0407. (Sooy, NJ)

PAKISTAN–Radio Pakistan, 11570 at 1700 with IS, ID, national anthem, international news, Koran, in EE. (Rausch, NJ)

PAPUA NEW GUINEA–Radio New Ireland, 3905 at 1018 with rock. (Foss, AK)

Radio Morobe, 3220 at 0953 with music. (Foss, AK)

Radio Madang, 3260 at 1002 with news in Pidgin. (Foss, AK)

Radio East Highlands on 3395 at 1011 with local music. (Foss, AK)

Radio East New Britain, presumed, 3385 at 1025 in presumed Pidgin with country, local "sing-sing" music, talk. (Lamb, NY) 0900 with news in EE, pops with woman in Pidgin from 0911. (Foss, AK)

PERU–Radio Tarma, 4775 at 0441 in SS with pops, IDs, organ music to closing at 0459. (Lamb, NY)

Radio Eco, 4505 at 0806 in SS with Peruvian music, echo announcements, ID. (Lamb, NY)

Radio Eco, 5097 at 0232 in SS with Latin pops, possible ID, heavy CW QRM. (Lamb, NY)

Radio Satelite, 6724.3 at 0145 in SS with futbol match to ID at 0200. (Rausch, NJ)

Radio San Martin, 4810 at 0937 in SS with ID, huayno music, US rock. (Rausch, NJ)

PHILIPPINES–FEBC, 11690 at 0915 with "Computer Corner" program. (Seefeldt, WI)

VOA relay, 15425 at 1406 with news, ID, "Concert Hall" and then blocked by WRNO sign on at 1430. (Lamb, NY)

PORTUGAL–Radio Portugal, 9570 at 0232 with news. (Sooy, NJ) New 17900 at 1918 with "Portugal Past and Present" feature.(Lamb, NY)

Radio Free Europe, via Portugal transmitters, 11815 at 0400 with IS, ID, news in Romanian. (Lamb, NY)

ROMANIA–Radio Romania Int'l, 5990//11830 at 0400 with frequencies and ID. (Sooy, NJ) 11830 at 0200. (Pellicciari, CT)

RUSSIA–Radio Moscow on 9640 at 0501, 9685 at 0340, 9750 at 0605 and 11770 at 0325, the latter in RR. (Sooy, NJ) 15290 at 1800. (Pellicciari, CT) 17860 at 0232. (Low, TX)

Radio Pamyat, list, 11650 at 1225 in Russian or Ukranian. (Northrup, MO)

RWANDA–Deutsche Welle relay, 7225 at 0456 with IS, ID.(Sooy, NJ)

SEYCHELLES–BBC relay, 15420 at 0332 with "Network Africa" and African music. (Lamb, NY)

FEBA, 11810 at 0314 with IS, ID, African Christian music, religious program in Swahili. (Lamb, NY)

SINGAPORE–SBC Radio One, 11940 at 1400 with news, ID "You are listening to the news from Radio One." (Zamora, CA)

BBC relay, 11750 at 1608 with news and sports. (Lamb, NY)

SOLVAKIA–Radio Slovakia Int'l, 5930 at 0102. (Lamb, NY)}

SOLOMON ISLANDS–SIBC, 5020//9545 at 1050 with pops, local music, relay of Radio Australia, sign off announcement with frequencies and anthem at 1128. (Lamb, NY)

SOUTH AFRICA–Channel Africa, 9695 at 0430 with news and music. (Sooy, NJ)15220, ex-17710 at 0600 with sign on, news and sports. (Lamb, NY)

SOUTH KOREA–Radio Korea, 5975 at 1400 sign of, news. (Zamora, CA)

SPAIN–Spanish National Radio, 9530 at 0010; 0510. (Seefeldt, WI; Sooy, NJ) 11880 in SS at 1310. (Northrup, MO)

SUDAN–Radio Omdurman, 7200 at 0545 in African language, music, into possible AA at 0350. (Sooy, NJ) 0309 in AA with Korean, ID, anthem, news. (Lamb, NY)

SWAZILAND–Trans World Radio, 7215 at 0413 in Chewa with religious service, into EE at 0430. (Lamb, NY)

SWEDEN–Radio Sweden, 15240 at 1509 with report on 105 year old sailing ship. (Pappas, SD)

SWITZERLAND–Swiss Radio Int'l, 6135/ /9860//9885//12035 at 0425 with ID and business news. (Sooy, NJ) 9885 via China with IS to 0000. (Vaage, CA)

TAIWAN–Voice of Free China, via WYFR, 21720 at 2240. (Low, TX)

THAILAND–VOA relay, 11820 at 1100 in Mandarin. (Rausch, NJ)

TAHITI–Radio Tahiti, 11826.7//15168 in FF at 0652 with songs in FF and EE during "Te Vevo" program. (Pappas, SD)

TUNISIA–RTV Tunisienne, 7475 at 2058 in AA and mid-East music, ID, possible Islamic religious program. (Lamb, NY)

UNITED ARAB EMIRATES–UAE Radio, Dubai, 11945 at 0245 in AA with singing prayers. (Sooy, NJ) 11945//13675 at 0329 with ID, frequencies, news, historical feature. Also on 15435 in AA at 1400 sign on. (Lamb, NY)

VATICAN RADIO–7305 at 0250. (Seefeldt, WI) 11625 at 0544 in PP with religious talks, classical guitar, ID, IS. (Lamb, NY)

VIETNAM–Hanoi 1, 10059 at 1220 in VV. (Northrup, MO)

YUGOSLAVIA–Radio Yugoslavia, 9505 at 2059 with IS, ID, sports, and musical heritage program. (Lamb, NY)

And that's it. A big round of applause for the following reporters who did their thing this month:

Marie Lamb, Brewerton, NY; Marty Foss, Pitkas Point, AK; Larry R. Zamora, Highland, CA; Steve Pellicciari, Norwalk, CT; Brad Low, Jacksonville, TX; Mark Northrup, Gladstone, MO; Ed Rausch, Cedar Grove, NJ; Marina Pappas, Huron, SD; Bjorn F. Vaage, Granada Hills, CA; Jeff Seefeldt, Wausau, WI; Kenneth G. Sooy, Sr., Oceanville, NJ and Marti Rogen, Jr., Camus, WA. Thanks to each of you!

Until next month, good listening! ■

IMPROVE RECEPTION

SUPER SCANNER STICK

Only $80

Get great scanner reception with our SUPER SCANNER STICK. Covers all scanner bands (25-1200MHz) Only 35" long. Powerful 15db amplifier. 25' of cable supplied with connector for your scanner.

SCANNER STICK Same as above but without booster amplifier $40

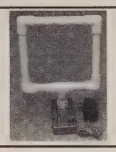
CELLULAR reception unsurpassed! Our new SUPER DANA antenna combines a 9db gain antenna with 15db amplifier for a fantastic 800-950MHz reception. SUPER DANA $80

ANTENNA PLUS

$90

Make your receiver spring to life! Receives like the large antennas yet sits on your table! Strong internal 15-22db amplifier! 115VAC pwr. Cable to rcvr. INCLUDED!

ANTENNA PLUS-1 0.5-1300MHz "All Bands" (for wide coverage rcvrs.)
ANTENNA PLUS-2 0.3-30MHz "Short-Wave" (peaked for SWL's)
ANTENNA PLUS-3 25-2000MHz "Scanner" (peaked for VHF-UHF)



AM BROADCAST LOOP ANTENNA

Fantastic AM (.5-2MHz) reception without bothersome noise! Easily null out interference! Compact desktop unit with internal amplifier. BCL-1 $125

CAR ANTENNA RECEIVES SCANNER/SWL!

Yes, with our MSW-1 amplified coupling box your car antenna can provide outstanding reception for your scanner or worldband radio. Existing car AM/FM is unaffected (unlike similar devices that reduce AM reception) Covers 0.5-1000 MHz with 10db amplifier. Only $70

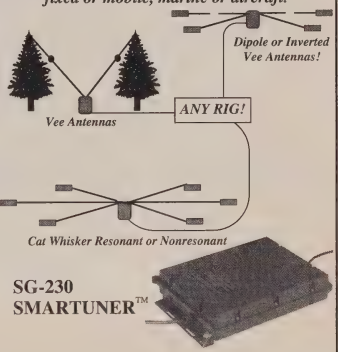
Conterminous US Shipping/Handling $5, Canada, AK, HI, PR $8. NY and MI add sales tax.

MANY NEW PRODUCTS CALL FOR DETAILS!

ELECTRON PROCESSING, INC.
PO BOX 68
CEDAR, MI 49621 (616) 228-7020

3 to 12 dB MORE FROM YOUR DIPOLE, VEE OR LONGWIRE BASE STATION ANTENNA!

SGC's SG-230 computer controlled coupler works with any radio and any antenna system - fixed or mobile, marine or aircraft.



SG-230 SMARTUNER™

SGC's SG-230 Smartuner™ will outperform any built-in antenna coupler on any radio. The reason? The SG-230 mounts AT THE ANTENNA! This means you're matching the precise condition of the antenna - not just loading up a feedline and shunting power to ground. Ask any Smartuner user - this unit delivers great performance on any frequency from 1.8 to 30 MHz. Call for a free package of information from SGC, 1-800-259-7331 or circle our Reader Service number.

SGC

P.O. Box 3526, Bellevue, WA 98009 USA
Tel: 206-746-6310, Fax: 206-746-6384

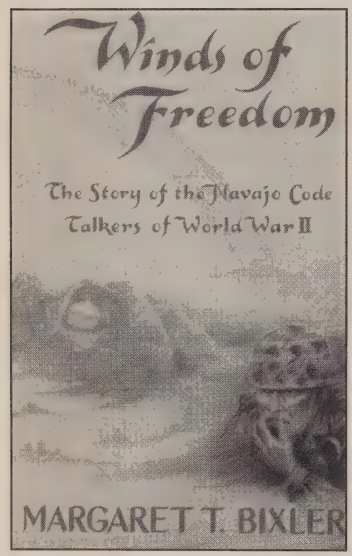
CIRCLE 82 ON READER SERVICE CARD

BOOKS YOU'LL LIKE

BY R.L. SLATTERY

Navajo Code Talkers

During World War II, if there was any hope of sending military communications with any degree of security at all, it meant complicated encryption systems designed for the written word. Encoding and decoding encrypted written traffic was usually slow going and required a lot of hardware. At best, this wasn't as fast as exchanging voice traffic, but then there were no encryption systems designed for voice communications. The languages of the world were too widespread to use in order to achieve any security. In a combat situation, however, voice encryption would be the only realistic approach for troops in the field.



A wonderful book, *Winds of Freedom*, by Margaret T. Bixler, is the fascinating story of the Navajo Code Talkers of World War II. Their own unique language was the basis for a secret code the Navajos developed and used during the Pacific war. Navajo happens to be a language that is extremely difficult for other cultures to learn or understand.

During World War II, complex written crypto systems like Enigma and The Purple Code were broken, along with many others. Yet, the spoken Navajo code was so effective that it was never cracked by the enemy. This amazing code, and the Navajos who went into battle for their country to provide the secure voice communications, played a vital role in military communications throughout the war in the Pacific. This was especially true at Iwo Jima.

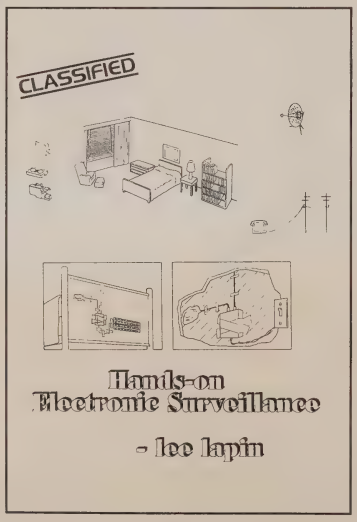
Bixler's 185-page books is filled with maps, photos (color and black/white), documentation, interviews, memories, and history. The declassified Navajo code is also provided. Each specific battle in which the Navajo Code Talkers were vital is discussed. There's much more to this worthwhile and well-written book, including very interesting general information on the Navajo culture. Bixler spent a sufficient amount of time with the Navajos in researching this book to gain a meaningful perception of their feelings towards the creation of the code and its use.

Winds of Freedom is $16.95 in softcover, or $21.95 in hardcover. It's from Two Bytes Publishing, 219 Long Neck Point Rd., Darien, CT 06820.

Inside Information

Designed to be like a private consultation with surveillance and security specialist Lee Lapin, his book, *Hands-On Electronic Surveillance,* consists of high-intensity, hard information presented to someone seriously interested in the subject.

Hands-On Surveillance, which is illustrated with diagrams and photos, is a report on the design, placement, and use of audio surveillance systems; cutting edge transmitters, receivers, and integrated systems. It covers mic placement and hardwiring tips; wireless units; gain antennas; wave propagation; placement considerations and planning; prefabricated systems; correct use of body mikes; setting up a listening post. Equipment tests, sources, and step-by-step instructions to maximize any intelligence gathering effort.



Lapin's book contains the latest equipment and techniques for particular applications. Utilized by professional investigators and law enforcement agencies, over the years Lapin's many books have been invaluable to anyone involved or interested in intelligence collection and surveillance equipment and techniques. As is often the case, much of Lapin's information simply doesn't exist in print elsewhere.

Hands-On Electronic Surveillance is $22.95, plus $4 shipping and handling ($5 to Canada) from CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725. Residents of NY State, please add $2.29 tax. VISA/MC welcomed. Phone orders: (516) 543-9169. FAX orders (24-hour line): (516) 543-7486.

In addition...

SWL's, scanner users, and hams will appreciate a new do-it-yourself antenna compendium that reprints W. Clem Small's antenna writings from past issues of *Monitoring Times* then adds new material as well. There are 112 pages in *The Antenna Handboook* explaining how to build a wide variety of receiving and transmitting antennas. This book is $12.95 from Grove Enterprises, P.O. Box 98, Brasstown, NC 28902-0098.

Ham Radio Contesting by Robert J. Halprin, K1XA, is a 73 page comb-bound: how-to treatise on the fine art of contesting. Whether you are just getting into this aspect of hamming, or if you would like to improve your results, this is worth a look since it's written by an operator who is a well-known contester. Halprin is a former ARRL staff member whose duties included overseeing the ARRL contest program. Good book that looks like it covers its topic thoroughly. It's $14.95, plus $2 s/h ($3 foreign) from Tiare Publications, P.O. Box 493, Lake Geneva, WI 53147. VISA/MC are OK. Phone orders: (414) 248-4845.

Save Up to 46% on POPULAR COMMUNICATIONS

Get fast home delivery of Popular Communications and save $15.45 a year over the newsstand price. Save even more on 2 or 3 year subs.

- ☐ **1 year - 12 issues $19.95**
  (Save $15.45)
- ☐ **2 years - 24 issues $38.00**
  (Save $32.80)
- ☐ **3 years - 36 issues $57.00**
  (Save $49.20)

Canada/Mexico—One year $22.00, two years $42.00, three years $63.00; Foreign—one year $24.00, two years $46.00, three years $69.00. Foreign Air Mail—one year $77.00, two years $152.00, three years $228.00.

(Please print clearly)

Name _____

Street _____

City _____

State _____ **Zip** _____

☐ Check or Money Order enclosed

Bill to ☐ Mastercard ☐ Visa

☐ American Express

My account number is: **Expiration date:**_____

Note: Allow 6-8 weeks for delivery of first issue.

FOLD HERE

IMPORTANT: BE SURE TO ENCLOSE YOUR CHECK OR MONEY ORDER

POPULAR COMMUNICATIONS

The World's largest, most authoritative monthly magazine for Short Wave Listening and Scanner Monitoring. Read by more active listeners than all other listening publications *combined!* If you enjoy radio communications you'll love

POPULAR COMMUNICATIONS

Subscribe today and Save!

RETURN ADDRESS (Please Print)

NAME _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

First Class Mail Permit No. 2055, Hicksville, NY

POSTAGE WILL BE PAID BY ADDRESSEE

POPULAR COMMUNICATIONS

76 North Broadway
Hicksville, New York 11801-9962

WHERE NO MAN HAS GONE BEFORE

NEW

Shown with optional TA100S antenna–Actual frequency measurement shown (not simulated).

OPTOELECTRONICS' New HandiCounters® are Light Years Ahead!

Only Our New 3000A & M1 HandiCounters® Can Give You *THESE* Numbers!

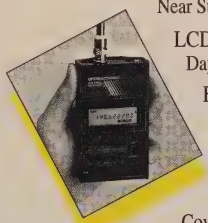
- 15 Gate Times selectable from 100 micro sec. to 10 sec.
- 7 Hour Battery Life (3000A)
  6 Hour Battery Life (M1)
- 10 Digit LCD Display
- 16 Segment Bargraph
- 3 Data Storage Registers
- 13 Mili Second (1.3% of a second) Measurement Rate
- 1 Hz Resolution in 1 Second for frequencies below 250MHz
- 2 Wire Serial Output for Data Logging
- 19 Years of Dependability & Service
- 10 Hz Resolution in .4 seconds for frequencies below 1GHz
- 10 MHz Industry Standard Time Base

Plus all these incredible features:

OE10 INSIDE
Ultra Reliable–Ultra Fast Counter IC

DIGITAL FILTERING *pat. pend.*
Fastest Method to Reduce False Counts—No Loss of Sensitivity

DIGITAL AUTO CAPTURE *pat. pend.*
Auto Holds & Stores—Works Even Near Strong RF Fields



LCD BACK LIT DISPLAY
Day/Night Visibility

FULL RANGE COUNTER
Includes High Impedance 50ohm Amplifier for 10Hz and up Coverage

HI-TECH EXTRUDED ALUMINUM CABINETRY
No Sheet Metal

ENVIRONMENTALLY SAFE
No Soldered in NiCads

MADE IN THE USA

PC Data Logging with optional CX12 RS232 Convertor ($89.)

	3000A	M1
Digital Filter	•	•
Digital Auto Capture	•	•
Computer Interface (Serial TTL)	•	•
10 Digit LCD	•	•
Multi Function	•	
Back Light	•	•
Battery Life	6-7 hrs	5-6 hrs
Range	10Hz - 3GHz	10Hz - 2.4GHz
Size	5.4' x 4'	3' x 5'
OPTIONS		
Back light	standard	standard
TCXO ± .2ppm	$100.	$100.
PRICE	**$329.**	**$229.**

OPTOELECTRONICS

Factory Direct Order Line
1-800-327-5912

305-771-2050 • Fax 305-771-2052
5821 NE 14th Ave, Ft. Lauderdale, FL 33334
5% ship/ Handling (Max $10) U.S. & Canada. 15% outside continental U.S.
Visa, Master Card, C.O.D., Cash or Money Order only.

BY DON SCHIMMEL

COMMUNICATIONS CONFIDENTIAL

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

According to an Associated Press item, the Interpol organization now has 169 country members and a new Headquarters in Lyon, France.

In 1989, Interpol moved from Paris to Lyon. Since that time, all hard copy files were converted to computer files. These records are now instantly available through the Automated Search Facility which has been in operation for one year.

In the past there have been complaints by some police that it required too much time to get things done through the Interpol system. However, new state-of-the-art communications and data systems should help eliminate such complaints. The worldwide installation of the upgraded facilities is scheduled to be completed by 1995.

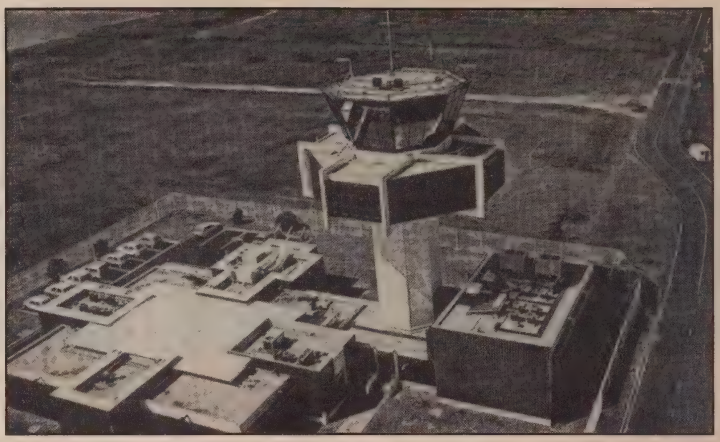
In spite of the expected improvement, the 12 European Community countries will go ahead with the formation of a police network, "Europol," which will duplicate Interpol's efforts in Europe.

It is interesting to note that since 1990, 15 former Iron Curtain countries have joined the interpol data exchange.

Coverage of Interpol communications can provide some very interesting listening. Two frequencies that have been quite active in the past are 10390 and 6792 kHz. CW and SITOR-A transmissions have been reported on those frequencies.

Ken Sooy, Sr., NJ, sent in a publication of interest to Aero monitors. The title is "International Notices to Airmen," and it contains background information pertaining to temporary hazardous conditions in particular locations, changes in facility operational data, etc. This biweekly publication is available from the Superintendent of Documents, Washington, DC 20402 and costs $45 (Domestic) or $56.25 (Foreign) per year. The publication number is S/N 750–00300000–1.

Ed Rausch, NJ, sent along some details with the PFC returned to him from the Tahiti LDOC. The frequencies listed for the station were 3467, 5559, 5643, 8867, 10084, 11327, 13300 and 17904 kHz. Ed mentioned that 5643 and 8867 kHz seemed to be best for US East Coast listeners. Transmissions are heard as early as 0500 and as late as 1100 UTC. Noticeable morning grayline enhancement. Stations heard included Auckland, NZ; Sydney, Australia; Tahiti, FP; Nandi, Fiji; and Easter Island. Also conducts SAR ops in conjunction with Rescue Coordination Center of Tahiti. Has at its disposal three a/c from French Navy's 12S Squadron, a/c of local airlines and various ground vehicles and seacraft.



Accompanying the PFC returned to Ed Rausch was this photo of the Tahiti Air Control Center.

Richard Baker, OH, ran across the callsigns Raider and Raider Base on 6230 kHz. My refs show KC-130 a/c and MCAS El Toro, CA respectively for idents.

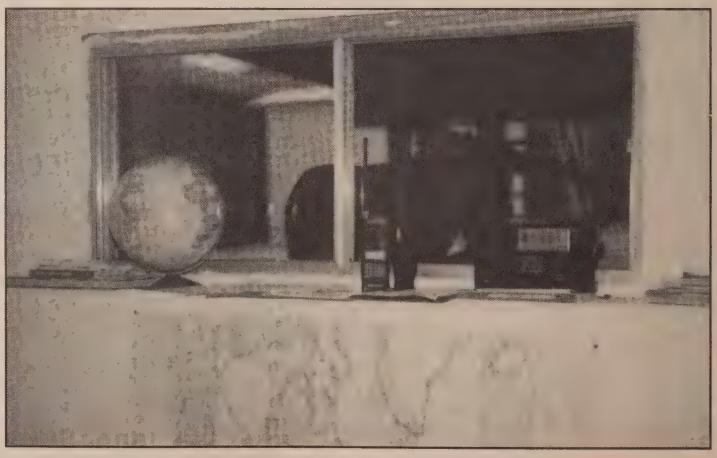
Richard also mentioned that his QSL returns were just about 64 percent.

Bill Underwood, NJ, wrote, "I use a DX440 to monitor whatever I can with no special interest." Welcome to the column Bill, we are looking forward to some loggings from you.

Another DX440 user is D.O. Buck, Ontario, Canada, who sent along some loggings for the column this month.

And from Tony Dorbuck, CT, came word that he is using an old Navy RBM receiver (0.2 to 2.0 MHz) along with a real antique—an RCA DZ-2 direction-finder receiver (15 to 1750 kHz.)

Tony said that WWV comes in on 60 kHz pretty regularly. His antenna is a 100–foot wire although he has been exper-



Listening post of Mark Heywood, Canada.

Your HAM RADIO LICENSE is only hours away with THE ARRL TECHNICIAN CLASS VIDEO COURSE

The Fast, Easy, Fun Way to Pass Your Novice- and Technician-Class FCC Written Exams!

ENJOYING HAM RADIO HAS NEVER BEEN EASIER!

Get the Best, When You Need the Best!

- Only the **American Radio Relay League (ARRL)**, the national organization of Amateur Radio Operators, has more than 75 years experience in helping people—just like you—become hams. With our expert help, **you'll be on the air in no time!**
- The ARRL Technician Class Video Course demonstrates **every** important concept on video. You succeed because you completely understand the material, not because of rote memorization.
- Only the ARRL has the resources to make sure you have the latest, most accurate information on video. With the ARRL, you **know** your course is fully updated for the current FCC exams.
- Your course is produced in assocation with King Schools, whose award-winning "Monster Graphics" let you see your instructor and "the action" at the same time.
- With the ARRL, expert help is only a phone call away. Call us any business day, **toll-free**, to have your questions about the ARRL Technician Class Video Course or your FCC exam answered personally.

Your Complete ARRL Technician Class Home Study Video Course Includes:

- **Three exciting video tapes—five hours of invaluable instruction—covering everything you need to pass your Novice and Technician Class written exams**
- **164-page Course Book with detailed notes.**
- **Every FCC question—with correct answers and detailed explanations.**
- **Six practice exams to "tune you up" for the real exam. On the big day, you'll be relaxed—and more than ready!**

Your ARRL Technician Class Video Course is produced by King Schools, Inc., a recognized world leader in the production of exam preparation video courses. King videos work, and they get the job done for the student like no other medium can.

And your ARRL Technician Class Course is no exception. You'll witness the magic of King's 3-D animation and full screen "monster" graphics, see problems solved right before your eyes, and always be in complete control of the learning process — able to stop, rewind, and review any part of the course whenever you like.

KING SCHOOLS

Order Risk Free

We're so sure you'll do well on your exam with the Technician Class Video Course that we make this guarantee:

1. Examine your Technician Class Video Course free for 20 days. If it's not what you expected, simply return it for a full refund—no questions asked.

2. You will pass your FCC written exam with the ARRL Technician Class Video Course. If you fail your test within one year, return your course and we'll refund your money. Every penny. **You pass, or you don't pay!** (Include a dated proof of purchase and the date and location of your VEC-administered exam session when you return your course.) **And...**

3. In addition, the veteran hams at ARRL Headquarters in Newington, Connecticut, stand ready to answer your questions and provide expert advice and information. **We won't let you fail.**

NO MORSE CODE REQUIRED

Your ARRL Technician Class Video Course is all you need to pass your FCC Technician Class exam and start exploring every nook and cranny of the VHF/UHF ham bands—that's full access: all bands, all modes!

Start with a simple FM mobile rig and follow your interests wherever they lead.

Optional Exam Software Available

The ARRL Technician Class Computerized Exam Review is a fun, user friendly program that lets you choose questions by subject, or take them all.

At your command, you'll see on-screen correct answers with ARRL's detailed explanations.

Plus... the program selects unanswered or previously missed questions, tracks your progress, and gives you a personal Report Card so you can watch your score improve!

So What Are You Waiting For?

With your new license, the world of Amateur Radio awaits you. Pass your written exam now with the ARRL Technician Class Video Course...and **get in on the fun!**

1. Your ARRL Technician Class Video Course, only $99

—OR GET EVEN MORE!—

2. Your ARRL Technician Class Video Course, Plus The Technician Class Computerized Exam Review Program (A $49 Value), all only $119

To Order, Call 1-800-32-NEW HAM or Tear Out And Mail Today

OK! I want to start enjoying the World of Amateur Radio. Rush me:

- ❑ Complete ARRL Technician Class Video Course, Only $99
- ❑ Complete ARRL Technician Class Video Course And Technician Class Computerized Exam Review. All only $119

Computerized Exam Review

❑ Macintosh ❑ IBM Compatible (512k, hard drive)

Specify ❑ 3½" ❑ 5¼" Disks

The American Radio Relay League
Helping Hams Get Started Since 1914

225 Main St, Newington, CT 06111
PC 203-666-1541 • Fax 203-665-7531

Ship To:
Name _____
Address _____
_____
City _____
State, ZIP _____
Telephone (_____) _____

Charge To: **VHS Format**
❑ MC ❑ VISA ❑ AMEX ❑ Discover
Card No. _____
EXP _____
❑ Check or Money Order Enclosed
TOTAL PURCHASE $ _____
Shipping and Handling _____
❑ UPS Surface, $5
❑ FEDEX 1-2 Day Delivery, $15
❑ In CT add 6% Tax _____
TOTAL AMOUNT $ _____

SHIP	HOMEPORT
USS Saratoga (CV 60)	Mayport, FL
USS Forrestal (AVT 59)	Pensacola, FL
USS Leahy (CG 16)	San Diego, CA
USS Harry E. Yarnell (CG 17)	Norfolk, VA
USS Worden (CG 18)	Pearl Harbor, HI
USS Reeves (CG 24)	Pearl Harbor, HI
USS Wainwright (CG 28)	Charleston, SC
USS Biddle (CG 34)	Norfolk, VA
USS Virginia (CGN 38)	Norfolk, VA
USS Texas (CGN 39)	Bremerton, WA
USS Baton Rouge (SSN 689)	Norfolk, VA
USS Richard B. Russell (SSN 687)	Vallejo, CA
USS Pegasus (PHM 1)	Key West, FL
USS Hercules (PHM 2)	Key West, FL
USS Taurus (PHM 3)	Key West, FL
USS Aquila (PHM 4)	Key West, FL
USS Aries (PHM 5)	Key West, FL
USS Gemini (PHM 6)	Key West, FL
USS Sierra (AD 18)	Charleston, SC
USS Yosemite (AD 19)	Mayport, FL
USS Hunley (AS 31)	Norfolk, VA
USS Joseph Hewes (FFT 1078)	Ingleside, TX
USS Bowen (FFT 1079)	New York, NY
USS McCandless (FFT 1084)	Ingleside, TX
USS Donald B. Beary (FFT 1085)	New York, NY
USS Jesse L. Brown (FFT 1089)	Mobile, AL
USS Ainsworth (FFT 1090)	New York, NY
USS Truett (FFT 1095)	Ingleside, TX
USS Moinester (FFT 1097)	Norfolk, VA

US Navy ships scheduled for decommissioning in FY-94. Time is running out for QSLing these. List courtesy of Richard Baker, OH.

imenting with a loop with very good results. He uses the loop mostly to suppress co-channel broadcast stations.

A note from David Sabo, Korea, told us of his attempts to log some LW stations but results were so poor that he just gave up on it. "My listening location and antenna set-up just doesn't allow for LW. A friend of mine who lives about two miles away has much better luck with LW beacons on his Drake R8, but he has about 50 feet of wire stretched from his second floor room to a nearby tree."

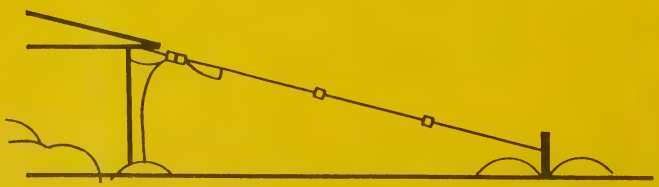
David sent along the address for Nairobi Aeradio for QSLing. Director of Civil Aviation, Directorate of Civil Aviation, PO Box 30163, Nairobi, Kenya.

I have been following with interest the reported development of a synoptic translator by Enterprise Radio Applications, Ltd., in the U.K. and according to a letter I received from ERA, so have a number of *POP'COMM* subscribers. The device will take Meteo coded messages and convert them into plain language.

After the company has received feedback from U.K. users and any bugs are eliminated, the equipment will be available from a U.S. outlet. As updated details become available, I will pass them along to readers.

The final item before turning to the loggings, was a note from Gary Spurway, Australia, in which he reported a RTTY transmission on top of the RTTY. HSD37, Bangkok, Thailand or NRV, USCG CommSta Barrigada, Guam.

When it comes to effective multi-band **DX** antennas for limited space applications, it comes to the world class **ALPHA DELTA DX-SWL** family of High Performance SLOPERS!



- Fully assembled, ready to use and built for long life. So strong, it can even be used to transmit—up to 2 kW!
- Superior multi-band performance on 13, 16, 19, 21, 25, 31, 41, 49, 60, 90, 120 meters plus the AM broadcast band (.5-1.6 MHz). All in a single compact antenna. Alpha Delta first!
- Efficent multi-band frequency selection by means of special RF choke-resonators—instead of lossy, narrow band traps.
- Overall length just 60 feet. Requires only a single elevated support—easier to install than a dipole.
- 50 ohm feedpoint at apex of antenna for maximum DX reception. A UHF connector is provided on the mounting bracket for easy connection to your coax.
- A top overall rating in Radio Database International's hard-hitting White Paper, "RDI Evaluates the Popular Outdoor Antennas."

- **Model DX-SWL,** AM broadcast thru 13 mtrs, 60′ long **$69.95**
- **Model DX-SWL-S,** as above but 90 thru 13 mtrs, only 40′ long **$59.95**

Available from your local Alpha Delta Dealer or direct. Add $5.00 shipping and handling (U.S.A. only) Exports quoted.

MasterCard VISA **ALPHA DELTA COMMUNICATIONS, INC.**

1232 E. Broadway, Suite 210, Tempe, AZ 85282 • (602) 966-2200 AA

CIRCLE 53 ON READER SERVICE CARD

Abbreviations Used For Intercepts

AM	**Amplitude Modulation mode**
BC	**Broadcast**
CW	**Morse Code mode**
EE	**English**
GG	**German**
ID	**Identification/Ied/location**
LSB	**Lower Sideband mode**
OM	**Male operator**
PP	**Portuguese**
SS	**Spanish**
tfc	**Traffic**
USB	**Upper Sideband mode**
w/	**With**
wx	**Weather report/forecast**
YL	**Female operator**
4F	**4-figure coded groups (i.e. 5739)**
5F	**5-figure coded groups**
5L	**5-letter coded groups (i.e. IGRXJ)**

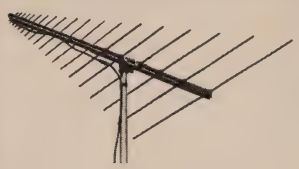
UTE Intercepts. All Times are UTC.

217: Beacon CSZ, Athens, TX at 1421. (Low, TX)
230: Beacon BU, Columbus, OH at 0430. (Vylasek, OH); Beacon REN, Richlands, VA at 1109. (Crabill, VA)
233: Beacon PDR, Ottawa, OH at 0431. (Vylasek, OH)
241: Beacon LNC, Lancaster, TX at 1905. (Low, TX)
245: Beacon GTP, Thomasville, GA at 1139. (Crabill, VA)
248: Beacon PQF, Mesquite, TX at 1909. (Low, TX)
263: Beacon JDN, Jordan, MT at 1120. (Vaage, CA)
278: Beacon FKR, Frankfurt, OH at 0445. (Vylasek, OH
290: Beacon TVK, Centerville, IA at 1135. (Crabill,

VA)
292: Beacon DP, Dana Point Breakwater Light 5, San Clemente, CA at 0250. (Vaage, CA)
296: Beacon LGD, La Grande Mun'l, OR at 1130. (Vaage, CA)
299: Beacon AVZ, Terrell, TX at 0006. (Low, TX)
302: Beacon L, Point Loma Light, CA at 1136. Is now constant and no longer alternating with Beacon V, Point Vicente Light, CA. Is only 36 miles from my location yet not heard since end of January? (Vaage, CA)
318: Beacon TY, Tyler, TX at 1139. (Crabill, VA)
322: Beacon S, Point Sur Lightship, CA. (Polhamus, CA)
326: Beacon, MA, Midland, TX at 0529. (Vylasek, MN); Beacon MCY, Mercury Dessert Rock near Reno, NV at 1144. (Vaage, CA)
353: Beacon ZES, Cape Scott CG, BC, Canada at 1152; Beacon LWT, Lewiston Mun'l, MT at 1113. (Vaage, CA)
356: Beacon VES, Versailles, OH, at 0518. (Vylasek, OH)
364: Beacon GV, Balkenburg, Holland at 0046. (Boender, Netherlands)
371: Beacon ACQ, Waseca, MN at 0558. (Vylasek, OH)
380: Beacon BBD, Brady Curtis Fld, TX at 1156. (Vaage, CA)
385: Beacon UWL, New Castle, IN at 0530. (Vylasek, OH)
391: Beacon CM, Columbus, OH at 0538. (Vylasek, OH);
Beacon GXD. Nacogdoches, TX at 0556. (Low, TX)
408: Beacon MW, Moses Lake, WA. (Forsman, CA)
411: Beacon RD, Redmond, OR. (Forsman, CA)
413: Beacon OEG, Yuma Proving Grounds, Amy Golden Eagles, AZ at 1208. (Vaage, CA)
521: Beacon INE, Missoula, MT. (Forsman, CA)
526: Beacon RWE, Camp Roberts, CA. (Forsman, CA)
2182: FFO, St. Nazaire, France w/navigational warnings at 1533; PBK, Netherlands CG w/Nav Wngs & wx on 1713 kHz also at 1533; ZCAP2, MV Atlantic Guardia clg Wick Radio at 1918; TSLQ MV Bizerte clg Stockholm Radio at 1929; GNK, Shetland Radio announcing wx on 1770 kHz at 1905; 9Hd, Malta Radio w/tfc list at 2133. All USB. (Boender, Netherlands)
2274: Dutch Army stns YTN, IRE & APN in USB from 2220 to 2240 re visit to a unit, complaint re food & need for mechanic at one of units. (Boender, Netherlands)
2416: Scrambled speech comms in USB at 2316. Also hrd scrambled comms on 2652, 2700, 3112, 3290, 3425, 3600 kHz. (Sevart, England)
2670: At 0312, USCG Greater Antilles Section, NMR1, CG San Juan, PR w/warnings of naval firing exercises and notice to mariners to 0329; USCG Charleston Group gives wx & notices to mariners at 0420. USB. (Baker, OH)
2716: At 0403 u/i ves Harvey Ranger w/Autec Op's (Atlantic Underwater Test & Evaluation Center) re 2400 (local) position check. USB mode. (Baker, OH)
3205/3606: 5F CW msg w/unusual characters at 2319. Still going at 0360. (Sevart, England)
3253: USCGC Bittersweet wkg CG Group Woods Hole re fire on MV Chubaco. Fire now out & 5 POBS safe. USB at 1030. (Rausch, NJ)
3961: 5F CW msg w/unus. chars at 2355. Going also the next night at 2347. (Sevart, England)
4280: IDQ, Rome Naval, Italy in CW at 0045 w/navigational warnings in IL. (Sevart, England)
4373: Oscar 6 in USB at 0451 w/position request. This is a Giant Killer Frequency. (Low, TX)
4395: YL/GC rpting 255 x3, 81915, 033 from 2200-05 foll by five tones and into 5f grps. Another day at 2100 CW stn sending 551 for five mins after which 040 was sent then into very slow CW 5f grps. Used cut nbrs AUV4ENDB9T. Also on 5315, so it is CW version of YL/CC stn. (mason, England)
4405/4113: Cruise Regal Princess, ELGH6, wkg WOM, AT&T High Sea's Station in FL for R/T tfc at 0405. USB. (Baker, OH)
4504: FJ42/59, u/i CW stn w/CQ call at 0030. Any ideas as to ID for this one? (Sevart, England)
4610.5: Gulf of Mexico oil rigs w/activity reports for last 24 hrs. 1041 UTC. (Rausch, NJ)

Wideband Log

antennas for scanners/ham



Perfect for fixed-base use of newer wide band handheld scanners and scanning receivers, this Wideband Log Periodic antenna covers all the action from 105 to 1300mHz! Improve your reception by 10-12 dB on all bands with just one antenna. You can even transmit on all Ham VHF/UHF bands! Use with fixed or rotatable outside mounts. 4ft 6in long and only 6 lbs.

only $249

Plus $6.95 S&H

1-800-950-WARE

Write for your FREE 64 page catalog

RADIOWARE

PO Box 1478 Westford MA 01886

(508) 688-4433

CIRCLE 79 ON READER SERVICE CARD

Computer Control Your Radio With SCANCAT 5.0 and SCANCAT-PRO!

Once you use the newest version of the SCANCAT 5.0 or SCANCAT-PRO computer program with your radio, you will never operate your radio again without it! SCANCAT controls the following radios:

- AOR 2500, 3000, 3000A
- DRAKE R-8
- ICOM R-71, R-7000, **R-7100, R-9000**
- JRC NRD-525, NRD-535
- KENWOOD R-5000, TS-50, TS-440, TS-450, TS-850
- YAESU FT-757GX, **FRG-100**, FRG-9600
- REALISTIC PRO-2004/5/6 with HB-232 Interface

Most ICOM and Kenwood radios - consult your radio's owners manual.

SCANCAT 5.0 FEATURES

- Create frequency databases
- Scan between ANY frequencies
- Up to 400 frequencies per file (unlimited with SCANCAT-PRO)
- Scan by ANY increment and delay
- **QUICKTERM** built-in TNC comm program with programmable macros
- Share any radio's file
- Faster Performance

AOR / KENWOOD 450-850 / DRAKE / YAESU* / ICOM* / NRD535
*Must have squelch detect cables for ICOM and YAESU (not required for R-7100, R-9000 ICOM OR YAESU FRG-100)

- Auto signal detection/scan stop
- Auto logging to disk files
- Spectrum analysis with spectacular graphics
- Save/load radio's memories to disk

SCANCAT-PRO ADDITIONAL FEATURES

- Multiple scanning banks
- Comma delimited conversion
- D-Base file support
- Unlimited file sizes
- Dual radio simultaneous scanning with ICOM radios

SCANCAT comes ready to run ALL supported radios within only ONE program. With an easy to use "POP-UP" interface, SCANCAT makes your listening hobby a breeze! Plus, the included **SCANPORT** feature allows you to download your favorite BBS, D-Base files, or import most columnar frequency lists to a running SCANCAT file. Requires MS-DOS compatible computer w/RS-232C serial port - hard disk recommended for SCANCAT-PRO. **Manufacturer's interface not included.**
CALL or WRITE for FREE information or our $5.00 FULLY OPERATIONAL DEMO DISK (includes shipping/handling). Once you see it, we're so convinced that you will buy either SCANCAT 5.0 or SCANCAT-PRO, that with your purchase of either version, we will refund the cost of the demo package and even pay the postage! FOR A LIMITED TIME, if you ORDER NOW, we'll include as a BONUS, FOUR SCANCAT FREQUENCY FILES!

SCANCAT 5.0 $49.95 **UPGRADE** $14.95
SCANCAT-PRO $79.95 **UPGRADE** $24.95
SQUELCH DETECT CABLES $24.95
PLUS $5.00 SHIPPING & HANDLING $7.50 FOREIGN

Charge Cards and COD Welcome - Please Call

COMPUTER AIDED TECHNOLOGIES
dba J & J Enterprises
P.O. Box 18292, Shreveport, LA 71138 • 3030 Hollywood Ave., Shreveport, LA 71112
Phone: (318) 636-1234 (8 a.m.-5 p.m. Central) FAX (318) 686-0449 (24 hours)
BBS (SCANCAT File Area) (318) 631-3082 (6 p.m. - 9 a.m. Central)

HOKA CODE 3 available starting at $495. For information write or call *ONLY*:
4001 Parkway Drive, Bossier City, LA 71112 (318) 747-6456

CIRCLE 71 ON READER SERVICE CARD

GET SERIOUS!

MAX 800 MHz GROUND PLANE

Hot Performer
Thousands in Use
Hear 10 Times More
The Best 800 Antenna

$31.95 for handheld
$35.95 for base

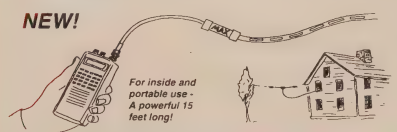
Attaches Directly to Scanner

MAX 46-49 MHz EAVESDROPPING ANTENNAS

For Cordless Telephones and Baby Monitors

MAX Half-Wave $29.95 *MAX 46-49 Dipole $49.95*

NEW!



For inside and portable use - A powerful 15 feet long!

Use outside or in attic . . comes with 50 ft of coax

Free Cellular and Cordless Frequency Charts

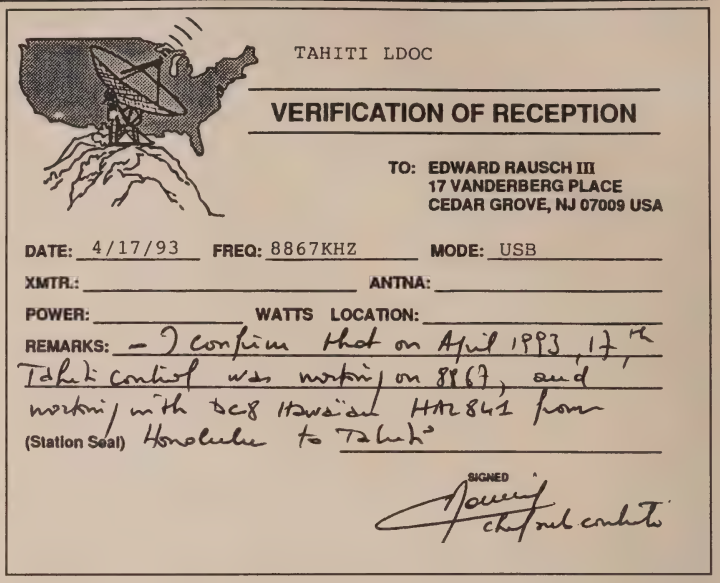
(with purchase)

1-800-487-7539 ORDERS

508-281-8892 info
508-768-7486 fax
SASE for Free Catalog
Shipping and Handling $4.00
CK-MO-MC-VISA (MA 5%)

Cellular Security Group
MAX System Antennas
4 Gerring Rd, Suite 300
Gloucester, MA 01930

4641: YL/EE rptng 609 x3, 1-0 count from 0000-0010 on a Tuesday. Then 10 beeps, count 132, x2, and into 3/2F grps. Rptd and off at 0035. (Mazanec, OH)
5015: US Army COE Comms at 1310. (Low, TX); YL rptng Romeo Delta from 2130-2135 foll by GG 5F msgs for 914 and 208. (Mason, England)
5230: YL rptng M1W2 from 2115-2120. Also on 8641. Mossad. (Mason, England)
5310: UN Naval ops in USB. N5V tracking MV Kalapiana at 2131, R6G tracking MV Vladimir Zatonskiy (UZMI) at 2135, and F8A clearing I9D "You are authorized to enter in Albanian territorial waters n order to regain contact and cruise for investigation." Sent at 2000. (Boender, Netherlands)
5340: CW stn sending LO LO/LO LO/LO LO from 2000-2005 then 56433 and into 5F grps. (Mason, England)
5500: YL/EE rptng 288 Oblique zero zero from 2000-05 & ended w/'OUT.' (Mason, England)
5529: Iberia Madrid wkg Iberia 534 in USB at 0544. (Nicholson, England)
5538: Falcon Bahrain (Gulf Air Ops) wkg company a/c (GFA 661) in USB at 2016. (Nicholson, England)
5544: Saudia OP Jeddah wkg several Saudia flights at 2020 in USB. (Nicholson, England)
5598: Shanwick wkg Reach 67945 in USB at 2320. Reach a/c having receiving problems & couldn't hear Shanwick or any other stations called. (Sevart, England)
5629: YL/EE Mossad stn rptng SYN6 at 0029. Stopped at 0035. (Sevart, England); YL rpts SYNW. USB at 2034. (Sabo, South Korea).
5649: Gander ATC wks Singapore 25, Lufthansa 463 at 0544. British Airways 282 at 0616, Swiss Air 874 & Aeroflot 347 at 0630. (Heywood, Edmonton, Canada)
5667: Honolulu Aeradio wkg Canadian 4 in USB at 1250. Foll by Honolulu to Northwest 28. Honolulu advised 28 to contact San Francisco on 5574 primary, 3413 secondary. (Sabo, S. Korea)
5680: Edinburgh Rescue wkg SAREX 137 in USB at 1935. (Nicholson, England)
5691: YL/RR Volmet in USB 1218-1219. Signed off w/ "Khabarovsk Mityor, Krenya." (Sabo, S. Korea)
5696: USCGC Forward wkg CommSta Portsmouth re a/c Orion 711 overdue Jacksonville NAS at 0920. At 0945 Portsmouth informed Forward that a/c on deck. (Rausch, NJ)
5710: Clandestine radio station and jammer at 0212 playing cat & mouse on 5710, 5720, 5730 kHz. Clandestine stn wud switch freqs and jammer wud follow. Also hrd another separate jammer on 5728 kHz. (Sevart, England)
5718: At 0340 "Victoria Search" wkg Rescue 111, then RES 456 re u/i SAR. 456 & 111 agreed to QSY UHF 363.0 MHz. USB mode. (Baker, OH)
5760: Army MARS net w/AA9WX, AR6PN (Shreveport, LA) and AR6WZ at 1417. (Low, TX)
5770: YL w/Delta Tango fm 2130-2135 foll by 5f GG msgs for 991/503/015 & 686. These addresses were all used by stations DFC37/DFD21 which shut down early 1993. Addresses have been greatly reduced in number and reallocated to various GG 2 letter stations. (Mason, England)
5973.5: At 0022 comms between Zeppelin One and Bad Boy in USB. One passed an encoded msg (nbr & ltr grps) to the other, and the reference made an exercise. Definitely seemed be military. (Brookman, AK) My refs do not show these callsigns.(ED)
6477.5: KPH, San Francisco, CA w/VVV mkr at 0407. (Low, TX)
6501: NRV, USCG CommSta, Barrigada, Guam in USB 1537-1540 w/urgent marine info bcsts incl advisories of distress calls. (Sabo, S. Korea)
6507: YL/GG w/5f grps at 0527. (Low, TX)
6577: Dominicana 223 wkg NY at 0158 in USB w/position report & Selcal check. (Bloisse, Dominican Republic)
6637: Lufthansa Frankfurt wkg company a/c at 1614. (Nicholson, England)
6675: CW stn in DSB AM mode sending 54768 fm 2120-2125 foll by 5f grps. (Mason, England)
6676: Sydney Volmet w/aviation wx at 0732. (Nicholson, England)
6679: Honolulu Volmet at 1405. (Low, TX)
6686: YSCG Cutters Courageous and Campbell wkg CTU coordinating ops in Areas Fox Gulf and Kilo to insure maximum radar coverage. (Rausch, NJ)


TAHITI LDOC

VERIFICATION OF RECEPTION

TO: EDWARD RAUSCH III
17 VANDERBERG PLACE
CEDAR GROVE, NJ 07009 USA

DATE: 4/17/93 FREQ: 8867KHZ MODE: USB

XMTR.: ANTNA:

POWER: WATTS LOCATION:

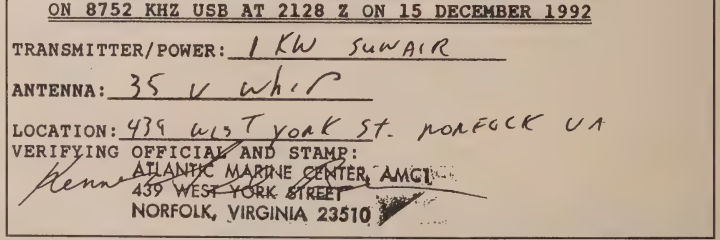
REMARKS: - I confirm that on April 1993, 17th Tahiti control was working on 8867, and working with DC8 Hawaiian HAL841 from Honolulu to Tahiti

(Station Seal)

SIGNED

Tahiti Air Control Center returned this PFC to Edward Rausch III, NJ.

6738: Yokota Air Base, Japan wrkd a/c reach 60180 w/pp's to Anderson Air Mobility Command post and to Anderson Meteo form 12191226. USB mode. (Sabo, S. Korea)
6996: USAF MARS net in USB at 1242 w/AFC6RI running patches for AGA8KU (Kunsun AB, ROK) and AGA8KA (Kadena AB, Okinawa) (Sabo, S. Korea)
7335: CHU, Time Signal Stn Ottawa, Canada in AM at 0914 w/announcements in EE & FF by OM. (Spurway, Australia)
7345: Automated beacon recorded YL "Contact Trenton Military Aerodrome for weather and aerodrome information." Hrd 0100. (Buck, Ont., Canada)
7404: YL rpting Kilo Romeo w/electronic tones fm 1430-35. Then 5f GG grps for 157 of 86 grps in length. (Mason, England)
7529.9: Base Camp 2 wkg Base Camp 6 w/informal comms re missionary work. At 0050 OM ID as Base Camp TEAD leaving the frequency. TE callsign is Costa Rica. (Rausch, NJ)
7532: YL rptng Golf Kilo fm 1900-05 then 5f GG msgs for 517, 477, 386. Rptd on various days on 6853 at 2130, 8063 at 1903 and 7404 at 2130. (mason, England)
7535: Norfolk SESEF wkg USNS Bighorn testing xmtrs. Tested 5 xtmrs in USB, LSB, ISB, Am and CW modes. SESEF wanted check FSK comms but Bighorn advised FSK generator malfunctioning. SESEF advised poor comms some xmtrs & wanted to know if amplifier was keying. Bighorn advised power output of 1 kW. Hrd at 1350. (Rausch, NJ); USS John F. Kennedy (CV67), NJFK, wkg SESEF for xmtr tests at 1533. At 1547 Philadelphia Naval Ship yard w/SESEF for radio test. At 1702 USNS Saturn (T-AFS-10), NADH, wkg


KVH
NOAA ATLANTIC MARINE CENTER

THIS WILL VERIFY RECEPTION OF:
KVH, NOAA ATLANTIC MARINE CENTER, NORFOLK, VA
ON 8752 KHZ USB AT 2128 Z ON 15 DECEMBER 1992

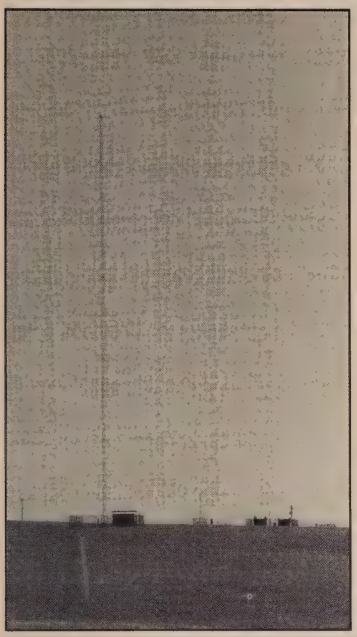
TRANSMITTER/POWER: 1 KW SUNAIR

ANTENNA: 35 V whip

LOCATION: 439 WEST YORK ST. NORFOLK VA

VERIFYING OFFICIAL AND STAMP:
ATLANTIC MARINE CENTER, AMC1
439 WEST YORK STREET
NORFOLK, VIRGINIA 23510

Here is a PFC used by Richard Baker, OH.



Federal GWEN VLF site located about 25 miles east of Buckley ANG base in Arapahoe County. Photo by Patrick Griffith, CO.

SESEF for xmtr tests. All USB mode. (Baker, OH)

7887: Lincolnshire Poacher—YL/EE nbrs stn in USB at 1708. Back on old freqs now, no longer on 5746 kHz. 7887//w/8464 & 9251 kHz. (sevart, England)

7918: YL in USB at 1732 rpts YHF2. Mossad. (Sabo, S. Korea)

8063: YL rptng Delta Mike w/toes fm 1900-05. At 1905, YL/EE w/'Message For 214, 20 Groups,' 'Attention,' and into 5f. (Mason, England)

8173: YL rptng Mike Delta fm 2000-05. Then "Message for 241/45 groups, 296/49 Groups, Attention," and into 5f groups in EE. (Mason, England)

8243: DLHK, m/v Abitibi Orinoco clg Nordeich Radio in USB at 2023. Told to rx on 13098 kHz. Also, PFSN, m/v Maersk Friesland clg Nordeich at 2028. Both vessels requesting pp's. (Nicholson, England)

8465: YL hrd w/5L grps in USB at 1537, then "end of transmission" within the minute. This was not he parallel w/similar bcst on 7540 kHz, which continued after 8465 went down. (Sabo, S. Korea)

8737: Wellington, NZ, ZLW, wkg pp tfc w/vessel Majorca at 0737. (Rausch, NJ)

8743/8219: KMI, Dixon, CA wkg DTFA, u/i vessel for R/T tfc at 0440. USB mode. (Baker, OH)

8746: Tokyo Marine Radio, JBO, w/tfc list at 1028. (Rausch, NJ)

8794: WLC, Rogers City, MI wkg two ships of Interlake Steamship Co. vessel James R. Barker, WYP-8657. Ships passing positions and stores info. Hrd starting at 1847. At 2048 WLC giving MAYFOR bcst for Great Lakes at 2100. USB. (Baker, OH)

8826: Honolulu aviation wx at 0935, EE/OM opr. At 0940 Tokyo aviation wx. EE/YL opr. All USB. (Spurway, Australia)

8846: American 664 in USB at 23032 wkg NY. Flight enroute Puerto Plata-JFK. Selcal check. (Bloisse, Dominican Rep); NY ATC wkg American 68 MIA-Madrid, American 1431 JFK-San Juan, Alitalia 631 Miami-Rome, Speedbird 292 MIA-LHR, and American 56 Miami-LHR. (Heywood, Edmonton, Canada)

8867: CG Rescue 1603 wkg Honolulu LDOC requesting special clearance to conduct SAR ops in warning areas at 0519. (Rausch, NJ)

8891: Cambridge Bay ATC 1545-1700 wkg United 802 Tokyo-Newark, Canadian 9T London-Calgary, Virgin 007 LHR-LAX, American 137 LHR-LAX. (Heywood, Edmonton, Canada)

8927: Saudia 116 w/Jeddah, requests wx for Aswan, Saudi 631 w/Jeddah, pp to Riyadh. USB at 2243 & 2245. (Boender, Netherlands)

8936: Someone on a/c Saudi Air 931 placing call thru u/i gnd station (poss Berne Radio, vy weak) to Dublin. A/c enroute to Nairobi. USB mode between 2016 and 2022. (Sabo, S. Korea)

8967: Lajes AFB wkg Reach 511201. A/c requested pp to Lajes Command post and Metro for 2200. USB at 1930. (Nicholson, England); Thule AFB, Greenland and Hickman AFB, HI w/coded SKYKING msg in USB 1037. Talk about your directional extremes! (Rausch, NJ)

8984: CG Rescue 1716 (HC-130) wkg NMN, Comm-Sta Portsmouth, VA, pp f, Miami Ops re divert & ck report relayed by Ham of poss sinking vessel, also had EPIRB activation 121.5, unknown if same. 1716 relays to NMN that Rescue 6575 (HH-65A) lost electrical system & 1716 enroute to assist. 1716 later reports 6575 in sight & headed towards land. 6575 later landed safely. USB from 1339-1903. (Baker, OH); Rescue 2107 wkg NMN & Miami Ops w/rdo cks. Advised completed drop to vessel. Shifted to 5696 kHz due poor signals. Hrd 0048. (Starr, MI)

9006: A/c Pirate 9 wkg St. John's military w/posit report & requesting wx St. John's for 1600. (Rausch, NJ)

9032: Architect wkg Ascot 1742 in USB at 1750. BAE 125 (XW788) enroute fm Vilmius to RAF Northbolt. (Nicholson, England)

9040: YL w/Papa Delta fm 1930-05. Foll by 5f GG msgs for 551 and 301. (Mason, England)

9274: YL/EE in AM at 1502 rpts 1-0 count, 125, x3 until 1510, then 10 beeps, count 225 x2 and into 3/2F grps. Msg rptd at 1531 and//11123 kHz. On another night, same opr at 1627 w/untypical 4F grps. (Sabo, S. Korea)

9362: Polynesian Airlines wkg Polynesian 2743 re Diplomatic passport. USB fm 0914-0920. Opr was EE/OM. (Spurway, Australia)

9651: CW Station at 2135 sent msg at approx 15 wpm. "QRA U6G-CC-NS-DN-TR-IMI." Rptd few more times and ended w/"AR" at 2139. (Low, TX)

9725: YL/CC passing 4f grps, each x2, in AM at 1309. Similar activity noted on the hour during evening on 8300, 11430, 15388 and 13750. (Sabo, S. Korea)

10018: Bombay Air wkg Aeroflot 569 in USB at 2017. (Nicholson, England)

10066: Calcutta Air wkg Speedbird 36 in USB at 1717. Also Dhaka on same freq wkg Speedbird 28 at 1728. (Nicholson, England)

10177: YL w/November Zulu fm 2200-05. Then 5f GG grps for 649 and 955. Rptd week later on 9450 kHz. (Mason, England)

10273.5: USAF MARS Pacific area net in USB at 1351. AFA8LG (Okinawa) wkg AGA8OS (Osan AB, ROK). Moved up here from 6996 kHz and called this freq "New 1." (Sabo, S. Korea)

10694: YL/CC in AM at 1204 rpts something like "yiao du liao fu jaio" 3 times, "o shi" 2 times, ns "ba seng liao" 3 times until 1207, then single "bai gi," and carrier abruptly down. Hrd something very similar on 5828 kHz several weeks before, tho' that was foll by what sounded like one side of a telcomm conversation. (Sabo, S. Korea)

10780: King 1 w/ Cape Radio standing by for wkg freq. QSY'd to 11104 kHz at 0435. Cape Radio at 1539 w/another stn xmtr problems. Cape Radio experiencing power outage. (Low, TX)

10800: Another weird xmsn in a tonal, Asian language (not Chinese) hrd in AM fm 1212-1224. YL rptd long, singsong preamble til 1215 then broke off into shorter elements all rptd before starting into long series of 5-element grps, each rptd x2. (Sabo, S. Korea)

10868.3: WGY912, FEMA Special Facility, Berryville, VA in CW w/msg of 18 grps (3 characters per grp) of mixed lttrs/nmbrs. Hrd fm 1545-1549 and msg rptd every minute on the minute. (ED)

11104: DOD Cape Radio w/King 1, 2, & 3 at 0436. Cape Osbourne checked in w/each a/c at 0441. They were preparing for tracking ops for shuttle Discovery (STS-56). (Low, TX)

11120: OM/RR w/5f grps, each x2. AM at 1408. (Sabo, S. Korea)

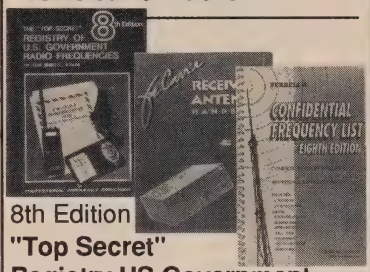
Revised and Up-dated

SHORTWAVE LISTENING GUIDE
by Harry Helms

Complete beginner's guide to setting up a shortwave station. Includes equipment, accessories antennas and more. 2nd edition

❑**HT-SLG Softbound $19.95**

***1994 Passport to Worldband Radio* $17.95**



8th Edition
"Top Secret" Registry US Government Frequencies

Latest edition from noted PopComm editor, Tom Kneitel, K2AES. Contains all the latest frequencies, callsigns and station data. This is one of the most complete frequency data books available to the radio listener. ©1993 268 pages

❑**CRB-TS8 Softbound $21.95**

RECEIVING ANTENNA HANBOOK

Carr gives you all the secrets of building high performance receiving antennas. Covers designs from 100kHz to 30 MHz. SWL's and CB'ers will find this a great book. Special emphasis on loops, Beverages and phased arrays. ©1993 208pages

❑**HT-RX Softbound $19.95**

GILFER CONFIDENTIAL FREQUENCY LIST

Covers utility stations from 2-30MHz. One of the best SWL books available.

❑**GL-CF Softbound $22.95**

Shipping: US $4.00 mail, $5 UPS. Foreign $7 minimun

Call for Free Catalog

☎ *(800) 457-7373*

(603) 899-6957 VISA

(603) 899-6826 FAX MasterCard

HR Bookstore

PO Box 209 AMERICAN EXPRESS

Rindge, NH 03461-0209

11176: E3Z clg Anderson AFB at 1422 for rdo ck. At 1808 Mainsail w/pp to Pope Command Center. (Low, TX); Reach 4069 wkg Offut w/load details incl courier material requiring a guard. Req pp w/Dover. Hrd 2202., SKYKING msg at 222. Initiated by Offut, rptd by Ascension and others. (Buck, Ont., Canada)
11205: NASA comms, Aria 7 w/Aria 1 (Advanced Range Instrumentation A/C), adv 1st motion time was 17:14:36. Hrd USB at 1715. (Baker, OH)
11282: San Francisco ATC wkg United 193 Los Angeles to Honolulu, Aeroflot 005, United 807 San Francisco to Seoul and United 897. Hrd 2100-2142. (Heywood, Alberta, Canada)
11300: French Air Force COTAM 8301 w/Addis in USB at 2230, Reach 5127 w/Nairobi requests VHF freq at 2245, Kenia 1127 w/Khartoum at 2253, Lufthansa 7330 w/Cairo & Khartoum at 2258. (Boender, Netherlands)
11330: Continental 440 wkg NY enroute Puerto Plata-Newark at flight level 350. Hrd 1945. Dominicana 905 at 2150 wkg NY. All USB. (Bloisse, Dominican Rep)
12214.2: CW stn at 1201 w/cut nbrs. R1W TR, TR AGM BT rptd x3 and into text. (ED)

When seconds count, *REACT*® needs you...

...to summon help for an injured motorists, an elderly woman trapped in a fire, a trucker stranded in a blizzard, a drowning child!

As a REACT volunteer CB radio monitor you may be the only communications life-line for someone in serious trouble. You relay messages from those desperate for help to police or other emergency services.

Your REACT Team will also use CB and other radio services to provide safety communications for events like parades, marathons and even balloon races. The fellowship with other REACT members at Team meetings and annual conventions is an added bonus.

Volunteer. Join Today!

Add a New, Exciting Challenge to Your Life. Help Save Lives and Property!

***REACT*® International, Inc.**
Tel (316) 263-2100
FAX (316) 263-2118
P.O. Box 998, Wichita, KS 67201

REACT.

CIRCLE 77 ON READER SERVICE CARD

12221: YL/EE in AM at 1205 rptd 409 x3 and 1-0 count til 1210 then 10 tones, "Count 225" x2 and into 3/2f grps.//with 13555 kHz. (Sabo, S. Korea)
12356: Sailing yachts in Pacific w/tfc to friends and family via u/i shore station in Hawaii. USB at 0510. (Rausch, NJ)
12454: TAH, Istanbul, Turkey DE TCYT, Burak Reis (Turkish Tanker) in CW at 2314. (ED)
13092: WOM, Pennsuco, FL w/tfc list on Ch 1206 at 1701. (Low, TX)
13225: Amman Operations Control w/Jordanian 102. A/c has trouble w/landing gear. Gear is don at Flight level 290. Take off weight is 182 tons. LDOC tells captain not to worry. USB at 1830. (Boender, Netherlands)
13282: Hong Kong Volmet w/wx bcst in USB at 1546. (Nicholson, England)
13309: British Airways Speedbird 10 wkg Bangkok Aeradio in USB mode at 1430. Bangkok advised this freq primary, 8942 kHz secondary. (Sabo, S. Korea)
13348: Iberia 6705 at 1753 in USB wkg Santo Domingo LDOC w/position report. (Bloisse, Domincan Rep)
13449.1: Weak FSK Morse signal hrd 1310-1312. Sending 5F grps & went down w/"K" and carrier off. (ED)
14408: YL/EE passing 3/2F grps in AM at 1328./ /11626 kHz. Concurrent, non//bcsts on 10529 and 16198 kHz. (Sabo, S. Korea)
14441: USN MARS. At 0006, NNNOCVQ, USCGC Forward (WMEC-911) wkg NNNONRJ w/QSY to 14470 kHz; at 0008 NNNOCNY USCGC Campbell (WMEC-909) clg Any Stateside Shore Station for rdo ck; at 0011 NNNOCVM USCGC Thetis (WMEC-910_ wkg NNNOUTO w/QSY 14818.5 kHz. (Baker, OH)
14452: CFARS C1W310, Alberta, Canada w/VXN 9, CFARS Nicosia for rdo ck. (Boender, Netherlands)
14622.8: Stn in FSK Morse at 1555 sending what sounds like "ETFNJX TKAGL" and rpts it over and over. (ED)
14675: OM/RR rptng 231 x3, 00000 fm 0910-0915 then off. (Mason, Wales)
14776: WGY912 at 1729 on FEMA Ch 36. W/ WGY909 at 1732 for msg from WWJ63 (SHARES Nashville, TN) to NMC (SHARES, San Francisco) re future SHARES exercise and damage assessment engineer. QSY's to F26 (10493 kHz) at 1736. (Low, TX)
15035: Edmonton Military (VXA) in USB w/aviation wx for Canadian military bases fm 1620-1626. (Caldicott, MA)
15175: Broadsword, u/i wkg u/i stn. QSY to freq Juliet 5, "If no comms in 2 minutes return 15175." USB at 0503. (Rausch, NJ)
16414: YL rptng Kilo Whiskey fm 1430-1435 foll by GG 5F grps for 513. At same time OM/EE Ship Captain of CCZL, u/i vessel requesting connection to marine services. OM/EE did not seem be bothered by number station. (Mason, Wales)
16754.8: RE DE QO (both u/i) in CW at 1753. QO continues clg and at 1754 sends "ANS HR K." After more clg QO again sends "ANS HR K" and then tells RE in Spanish that he doesn't hear him anywhere and "PSE QRX 2000 GMT." The QRX request was in EE. (ED)
16933.2: WCC, Chatham, MA w/VVV mkr at 1558. (Low, TX)
17016: SLHFM "C," Moscow hrd in CW at 1330. (Boender, Netherlands)
17281: BVA, Taipei, Taiwan w/tfc list in Taiwanese and EE at 1300. "Fu Yan 1 XVAL we have a call for you. Listening CH 802 1201 1631 2201." Very strong sig. (Rausch, NJ)
17975: At 2228, Offutt GHFC w/SKYKING EAM. //11176//8967 kHz. USB mode. (Baker, OH)
18171: DEA agents on Channel SI at 1845. Strong, data-like sig trying cover their QSO. (Jamming??). (Low, TX)
18486.2: CW stn calls 759 for about 10 mins, no tfc & carrier off. Hrd 1600-1610. (ED)
18870: RRG26, Radio Moscow feeder in USB at 1635. (Boender, Netherlands)
18881: This was a repeat at 1700 of nbr msg sent on 22222 at 1600. (Mazanec, OH)
22222: YL/EE at 1600 on Saturday rptng 104 then 627 x2, 39 x2 and into 5F grps, each sent twice. Ended w/5 zeros. (Mazanec, OH)
26010: CB Outbanders in USB at 2152 discussing channels. (Low, TX) ■

PIRATES DEN

BY EDWARD TEACH

FOCUS ON FREE RADIO BROADCASTING

As usual, there's been quite a lot of pirate broadcasting action on the bands in recent weeks.

Secret Mountain Laboratory was heard on 7475 at 0322 by Mike Leclerc in Connecticut playing folk and country music and saying the broadcast was from Hilo, Hawaii. Note we're picturing their QSL reply this month.

Leclerc had CSIC at 0206 on 7413 with the Voice of the Great White North slogan, Pirate Rambo with Psycho Chicken interval signal and giving the P.O. Box 109, Blue Ridge Summit, PA 17214 address. Also announces Box 293, Merlin, Ontario, N0P 1WO, Canada. Also heard on 9901 at 1306 and then at 2230 on 7413 with a rebroadcast of the 9901 program. Pat Murphy in Virginia heard 'em on 7415 at 2233 and notes the call letters were pronounced as "sea-sick." Jack Samuels in Georgia had them on 7415, and closing down at 2248.

Samuels had KMRZ at 0210 on 7415 with Dr. Lobotomy and playing various rock and pop things. Announces Box 452, Wellsville, NY 14895. Murphy noted them to sign off at 0235 with the Beatles and talk of Satan. Leclerc had this one on 6205 at 2333 with "techno-rock" music and twice on 7415–at 2230 with a test featuring reggae and rock and 0126 to 0134 when technical problems forced it off the airwaves.

Bill Matthieu in Massachusetts picked up the Ground Level Network at 0103 on 7441, featuring the host "Just Bob" and talks on various medical subjects.

Leclerc had Wire Line Radio at 2324 on 7437 with music and bad overmodulation which led to the broadcast being cut at 2352. They also gave the Blue Ridge Summit address.

Leclerc had Radio Stella International, "Scottish Free Radio," being relayed by NAPRS at 2300 on 7413 and on another day at 2231. Jack Wilson is the announcer and gave the address as 82 Pentland Place, Kirkcaldy, Scotland, UK. Mike notes that NAPRS uses the Wellsville address.

Matthieu checks in with a log of Pirate Radio Boston on 7435 at 2100 with rock and oldies and mention they were "run by DX'ers for DX'ers." They announced an address of Box 146, Stoneham, MA. No zip code noted.

Murphy had WJLR at 0020 to 0043 close on 7415 and slogan of "John Lennon Radio," rock music mix, song dedication to He Man Radio, thanks to Mr. Rausch in New Jersey and Mr. Murphy. Closed with sound effect of a wolf or dog howl. Leclerc noted this on at 0204 featuring Captain Crook with a rock music program.

George Roberts in Pennsylvania found Radio Azteca at 0510 on 7420 with announcer Brian Stocker giving the Wellsville address in Spanish. Leclerc had them on 7415 at 0109 with a comedy program and listener mail. Mike also noted this one on 7413 at 2349 with a rebroadcast of the earlier date broadcast. Also included the "Rocky and Bullwinkle" music as an interval signal.

Roberts heard Radio Airplane on 7415 USB at 1645 with Captain Eddy the host and various rock selections, barking dogs and mention of the Wellsville address.

Leclerc had Radio Caroline at 2324 on 6295 with 60s to 80s era rock songs.

Murphy reports WRV ("Radio Virus") at 0153 to 0218 close on 7415, playing rock with "real raunchy words." Said it was a test broadcast and talked about their "HIV Positive QSL card." ID as "WRV, the station that nobody wants to get." Leclerc heard them from 0049 to 0111 with technical problems (maybe they caught something?) and Wellsville address.

CRSM was another Leclerc logging, on 7413 at 2303. Their slogan is "Radio Scottish Montreal" and "Rob Roy" is the announcer. He played Scottish rock and commented on Scottish and Canadian affairs. Blue Ridge Summit address WRCR (Reality Check Radio) was logged by Leclerc with a test broadcast on 7415 at 2241 with talks about US social and political affairs. The announcer also noted that "free radio is meant to express a message, not to play music and find out how it sounded." The station did not have a mail drop yet, but the announcer said they were working on it.

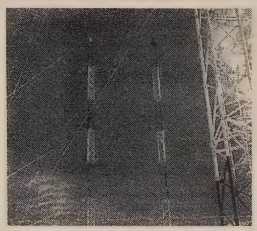
Pat Murphy heard Vox America on 7417 at 2303 to 2306 sign off, with rock music cutting in and out and ID, "This is Vox America testing–does anybody hear this signal?" And "This is Vox America" repeated several times.

RFM was spotted by Jack Samuels on 7416 at 0400 announcing the Wellsville address and airing fake commercials and country western music. Later heard QRM from Radio USA on or near their usual frequency.

That's a wrap for this time, folks. Remember to send me your pirate logs regularly. I'm also eager to receive QSLs and station photos we can use in the column, as well as information direct from pirate broadcasters!

Catch you all next month! ■

Official QSL Sheet



The Secret Mountain
Laboratory, Ltd.
P.O. Box 452
Wellsville, NY 14895

Celebrating it's ninth year of International Broadcasting!

Transmitter QTH: 20-42-41 N
156-15-26 W

This will confirm that _____
Of _____
Received SML on _____
At a Frequency of _____

The Secret Mountain Laboratory is a Free Radio Relay station, with local production facilities. Thank you for your reception report!

Equipment Compliment at SML
CCA 10,000E-HF
CRL HF Audio Processing
Antenna Gain: 23 DBI
Beamwidth: 30 degrees - Elevation: 20 degrees

A full page size QSL, complete with photo is issued by the Secret Mountain Laboratory. (Thanks for Gary K. Hamlin, New York).

TELEPHONES ENROUTE

BY TOM KNEITEL, K2AES

WHAT'S HAPPENING WITH CELLULAR, MARINE & MOBILE PHONES

We received information from Bridge Comm Corp., located in Illinois, announcing that there would be No More "Listening Toms" on *Cellular Phones*. I assume "Listening Toms" is a goof on the term "Peeping Toms," and not a reference to yours truly.

Bridge tells us they are forming a national telephone network dedicated to providing the cellphone user to secure calls to any phone in the world. The security is attained, they claim, because scanners cannot listen in, and there is no longer a need to have a scrambler on both ends of the conversation.

To be sure, there is some easy-to-install voice privacy hardware to be purchased and installed by the individual owning the cellphone. The equipment is manufactured by Cycomm Corp. of Portland, Ore., and distributed by The PrivaFone Corporation of Baltimore, Md. Bridge Comm has a patent on applications where the purpose of the call extension is to make the call traceable or untraceable.

The description of how this works is that it "allows any cellular phone user with a voice scrambler to place a secure call through its network by routing the call through and providing a dial tone to call over secure land lines."

No prices were provided for either the hardware or the service. There is a phone number of (312) 329-0008 you can call if you want to contact Bridge Comm Corp.

"Cellular Data Expo" was held recently in Philadelphia, Penna. Photo shows Donald A. Harris (right), President of Comcast Communications, Inc., discussing a new item at the show with Steve Faulk (left), a product manager at Comcast Metrophone. (Photo by Liz Wuillermin.)

What Big Ears You Have!

Did you know that some cellular phones can be made to answer an incoming call without ringing? Think about the possibilities of this taking place if a small cellphone is "accidentally" left behind at your home or office. Not good.

Also, be careful about what you say when people excuse themselves and leave their cellphones behind. Better yet, ban cellphones from your private meetings.

These helpful thoughts were provided by our friends at Murray Associates, Box 5004, Clinton, NJ 08809. Murray Associates is a leading provider to business and government of counterespionage and eavesdropping detection services throughout the U.S. Their phone number is (908) 730-8733.

Hot Stuff

Tom Kravitz, KI6BL, of Culver City, Calif., told me about *Fine Net*. This is a radiopaging system that transmits messages to thousands of firefighters, fire buffs, and news media across the nation. There are 2,000 Fire Net subscribers in Boston, New York, and Chicago. Southern California may be on-line by the time you read this. Fire Net information is also provided for Milwaukee, Washington (DC), and soon for Denver and San Francisco.

Many of the Fire Net dispatchers are disabled, retired, or off-duty firefighters. These are professionals who know how to interpret the important information coming through on their fire radios, then instantly capsulize it for Fire Net use.

Subscribers carry alphanumeric pagers that provide breaking information on fires, including the comms channel being used. Information on the status of major fires is revised and updated with status reports.

Tom says that more information on Fire Net (such as how to subscribe, or how to become a dispatcher) can be obtained by calling (310) 838-1436; Compuserve: 71674, 1610; or Prodigy TKXD40A.

Speaking of Paging

Motorola has embarked on a major promotional campaign to point out the many benefits of radiopaging to the public. The company is now offering a wide range of colorful and appealing pagers in all price categories.

The most basic and inexpensive of Motorola's new pagers is the Freespirit. This unit has a 12-character numeric display that can scroll through a 20-character message. It will store ten such messages in its memory. There is a musical tone alerting signal, as well as a vibrating silent alert. It has a belt clip, and comes only in charcoal gray. The Freespirit operates on two penlight (AAA size) batteries.

These pagers are sold by many Motorola dealers.

Catching the spirit of the national interest in beepers, NEC America, Inc. has brought out the *NEC Facts Sport* numeric pager in five bright colors.

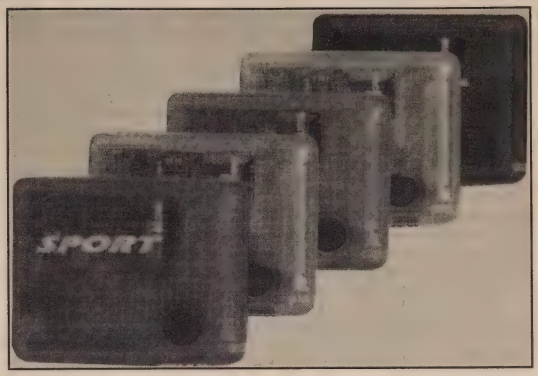
The device has a 16 message capability and a built-in clock and time stamp for all incoming messages. Runs on a single AAA battery. More information on the NEC Facts Sport by calling 1-800-5-ASK-NEC, Ext. 001.

Maritime Cellular Use

All cellular boating subscribers in the NY/ NJ coastal areas are reminded that their cellphones are an excellent emergency backup to VHF Channel 16 for contacting the Coast Guard during any emergency situation.

While VHF Channel 16 is the primary and preferred way of hailing the Coast Guard with a distress call, boaters can also get quick access to the agency via cellphone by dialing up *CG (STAR-CG). This operates at all hours, and works in the waters around Long Island, Staten Island, and the lower Hudson River. The service is pro-

Motorola's Freespirit pager is simple and inexpensive.



NEC America announced a colorful line of small pagers for this rapidly expanding market.

vided in the NY/NJ area by *Cellular One*, and is available to all boaters, including roamers.

Other areas where *CG works to summon the Coast Guard include Chesapeake Bay; Portsmouth, N.H.; South Harbor, Me.; Boston Harbor; Puget Sound, Wash.; Long Island Sound; Cape Cod; Martha's Vineyard; and Nantucket.

Air/Ground Matters

There was a request filed with the FCC by Cellular Data, Inc. (CDI) to authorize a provision of nationwide data services on a secondary basis in the 800 MHz air/ground phone service bands. These services would have been provided by companies unaffiliated with air/ground phone service suppliers. CDI noted that it wished to be issued a license to such data services.

The FCC turned down the concept. The FCC stated that it supported CBI's stated objective to attain maximum efficient use of the spectrum, but pointed out that air/ground telephone service was still in a formative state of development. Because of this, the agency feared that to start an air/ground data service on these same frequencies at this time, even on a secondary basis, could prove to be premature and might disrupt full implementation of air/ground phone service.

Air/ground phone service commercial ground station licenses were issued in December of 1990 and June of 1991. Licensees were given five years to complete at least 50 ground stations. In addition, they are still in the process of implementing new and more efficient transmission methods.

One advance is GTE Airfone's commercial airborne conference calling service which was just started last June on 11 airlines. To place a conference call, passengers press a speed-dial number on the phone at their seats. A special operator answers then sets up the call with all the other parties. These calls cost $5 per minute (domestic), plus a $2 set-up fee. So, a five-minute air/ground conference call with four ground parties costs $27. International calls run a bit more.

This summer, GTE Airfone also launched its fully digital GenStar system. On aircraft equipped with this system, passengers will be able to receive calls from the ground as well as transmit and receive data and paper faxes. This kicked off on the Delta Shuttle between Boston, New York, and Washington (DC). Watch for it on other Delta routes and in aircraft of other companies.

FlightPage

A new service for busy air travelers has been dubbed *FlightPage*. It provides instant information on available flights, as well as pricing and seating data. The information is served up to subscribers with an alphanumeric pager or a laptop computer equipped with Motorola's *NewsStream Advanced Paging Receiver*.

Using a keypad phone (including payphone, cellphone, or air/ground phone), a subscriber calls a toll-free number and requests flight data for any departure/destination cities in the USA. The best available direct flights and connections, and the best fares on flights with available seating, are instantly scanned in the computer of the Official Airline Guides. The data is then sent out via the National Dispatch Center through the facilities of an affiliated radio-paging service in the city where the caller is located. The entire process takes a matter of a few minutes.

For additional information on *FlightPage*, contact the National Dispatch Center, 12626 High Bluff Drive, Suite 150, San Diego, CA 92130. Telephone, (619) 401-9500.

We are interested in press releases, newspaper clippings, product and service information from manufacturers and service suppliers on the fields of cellular phones, pagers, marine phones, and other personal communications devices. ■

Need a GREAT-sounding, ULTRA-RELIABLE, SOLIDLY-made long play recorder? TIRED of POOR-sounding, FLIMSY recorders?

Why spend over $100 for a long play recorder "improvised" from a plastic "consumer-type"? Spend a few more $$ and get the BEST!

PROFESSIONAL 10 HOUR RECORDER. Built like a BATTLESHIP

* Special *Pop'Comm* price $139
* BUILT-IN voice activation (NO box dangling outboard) add $25
* Automatic telephone adaptor, FCC approved, ONLY $16
* Dialed number decoder, reads numbers from tape $59

No shipping charges on prepaid orders. COD's OK. Cal. residents add tax. Sorry, no credit cards (all they "do" is increase prices---)

FREE info for reader service card requests.
FREE 36 page catalog if requested by phone/fax/letter

VIKING INTERNATIONAL
SINCE 1971
150 EXECUTIVE PARK BLVD. #4600
SAN FRANCISCO, CA 94134
PHONE: (415) 468-2066
FAX: (415) 468-2067

CIRCLE 88 ON READER SERVICE CARD

WASHINGTON PULSE

FCC ACTIONS AFFECTING COMMUNICATIONS

Records Exempt Under Privacy Act

The FCC amended section 0.561 of its rules to exempt two new systems of records from certain provisions of the Privacy Act. In particular, it will establish two systems of records entitled "FCC/OIG-1, Criminal Investigate Files" and FCC/OIG-2, General Investigative Files."

The first system of records is limited to records on individuals, including present and former FCC employees, who are or have been the subjects of criminal investigations conducted by the Office of the Inspector General (OIG). These criminal investigations concern alleged violations of criminal laws which proscribe fraud and abuse in the execution of the Commission's programs and operations.

The second system of records will contain investigative materials compiled for general law enforcement purposes.

Under the Privacy Act, an agency that maintains systems of records pertaining to individuals must comply with certain procedures for the disclosure of information contained in the systems of records. Certain systems of records may be exempt from the procedures required by the Privacy Act if they are maintained in conjunction with activities pertaining to the enforcement of criminal laws. Systems of records containing investigative material compiled for general law enforcement purposes may also be exempt. The records maintained by the OIG fall within these two categories. In accordance with the Privacy Act, it is necessary for the Commission to adopt a rule to reflect the establishment of these two systems of records that would be exempt from certain Privacy Act provisions. The rule is typical of other Federal agency rules in the area.

Call For Club And Military Recreation Station Call Sign Administrators

The FCC adopted an *Order* (FCC 93-249) that authorizes it to use volunteer organizations for the purpose of providing amateur service club and military recreation station call signs. In the *Order,* the Commission delegated authority to the Chief, Private Radio Bureau, to execute agreements with qualified organizations that desire to provide services to the Commission as a club and military recreation station call sign administrator.

The purpose of this Public Notice was to announce that the Chief, Private Radio Bureau, will accept requests from organizations interested in becoming an administrator beginning July 26, 1993. Requests received before this date will not be considered. Organizations interested in becoming an administrator should familiarize themselves with the Commission's *Order* before applying.

Each organization requesting designation as an administrator must provide the information specified in Section 97.29 of the Commission's Rules, 47 C.F.R. § 97.29 (a) through (k). Additionally, the organization must include a listing of the 26 possible call sign blocks (NA through NZ) in descending order of preference. Requests will be processed in the order received at the address given below. Each administrator will be assigned the first available block of call signs based on its preference listing.

All requests must be signed by a responsible official of the organization and include the telephone number of a person familiar with the request. Requests must be sent to the Federal Communications Commission, Personal Radio Branch, Room 5322, Mail Stop 1700 C1, Washington, DC 20554, ATTENTION: CALL SIGN ADMINISTRATOR. Failure to follow these filing procedures will result in delinquent request not being considered.

At a future date, the FCC will announce by Public Notice the names and addresses of organizations that have been certified as a club and military recreation station call sign administrator.

For further information, call Maurice J. DePont at (202) 632-4964.

Apparent Liability For $50,000

The FCC notified CyberTel Corporation of an apparent liability for a forfeiture in the amount of $50,000 for violating the Commission's rules by operating station KSJ824, Galesburg, IL, above the effective radiated power (ERP) limits.

Commission rules that it permits a maximum ERP of 500 watts and CyberTel's authorization permits it to operate at this power. However, CyberTel was found to be operating with an ERP of 976 watts.

In its response to the Official Notice of Violation, CyberTel claimed that the excess ERP resulted from an inadvertent error in setting the transmitter output power by the contractor hired to install the equipment. According to CyberTel, this error was due to confusion created by two relocations of the station over a short period of time, and three different sets of engineering specifications, one for the original site, another for the site operated under special temporary authority and a third set for the new site.

The Commission pointed out that its rules state licensees shall remain fully responsible for the quality of maintenance, for compliance with all Commission rules, and for the general instruction given to contractors. The Commission found that CyberTel's operation was both unauthorized and continuous up to June 12, 1992. Consequently, CyberTel's operation constituted willful and repeated conduct within the terms of the statute. Pursuant to the Commission's *Policy Statement, Standards for Assessing Forfeitures,* the base forfeiture amount for exceeding ERP power limits is $50,000, and the Commission found that no adjustment to that amount was warranted.

Relaxation Of Equipment Authorization Requirements

The Commission proposed relaxing its equipment authorization requirements to allow unapproved aural broadcast auxiliary transmitters to be used for backup purposes under limited circumstances.

Beginning July 1, 1993, aural auxiliary transmitters must be approved under the current equipment authorization program or removed from service. The Commission has proposed allowing any such transmitters removed from service to be retained for backup purposes up to 720 cumulative hours per year.

The Commission believes this proposal said this would avoid burdening licensees with unnecessary expenditures while permitting backup of main systems that would otherwise not be economically feasible.

Petition For Changes On 220-222 MHz Band Denied

The Commission denied a petition by the United Parcel Service of America, Inc., (UPS) to (1) restrict the further circumstances in which the leasing of excess capacity of the nationwide non-commercial channels at 220–222 MHz will be permitted and (2) clarify that each non-commercial nationwide applicant must rely on its internal communications needs and financial qualifications as of the time its application was filed in satisfying the applicable entry criteria. In addition, on its own motion, the Commission deleted the rule that allows the use of a long-term business plan to satisfy the required 70-market showing.

In support of its first request, UPS contended that the leasing rule in its present form might encourage speculation by permitting a licensee without legitimate noncommercial communications needs to begin constructing its system during the third or fourth year of licensing, complete con-

struction at the five-year mark, and then act as a commercial provider without ever using the system for internal communications purposes.

The Commission said that in allowing non-commercial nationwide licensees to lease excess capacity, it noted that excess capacity was likely to exist only in those regions outside the largest metropolitan areas or in rural localities, and consequently, that excess capacity leasing on those channels would be an efficacious way to satisfy the land mobile communications needs of the public and to increase the overall spectrum efficiency of the non-commercial nationwide channels. To preserve the non-commercial licensees to construct 40 percent of their systems before excess capacity, leasing would be allowed and later barred the leasing of excess capacity entirely during the first five years of the license term. The Commission said it still believed that allowing the leasing of excess capacity only after expiration of the initial five-year period was the best way to balance its interests in spectrum efficiency and ensure that the non-commercial channels are used as intended.

With regard to entry criteria, the Commission noted that it had substantially changed the entry criteria applicable were filed and, therefore, it is appropriate that it allow applicants to amend their applications in response to the new rules. Moreover, permitting applicants who satisfied the original entry criteria to amend their applications in response to the new rules will not undermine the non-commercial character of the channels involved.

Finally, on its own motion, the Commission amended the rules which permit non-commercial nationwide applicants to rely upon either an actual presence or a long-term business plan to satisfy the requirement that they demonstrate the need for internal communications capacity in 70 or more markets. The Commission changed this to require applicants to rely on an actual presence only, finding that the long-term business plan portion of the rule is so amorphous as to be nearly impossible either to measure or to enforce. Because of this, the Commission said, this portion of the rule is susceptible to the type of abuse that could easily undermine the non-commercial nature of the channels explicitly set aside for internal communications.

Procedures At Gettysburg Licensing Division For Obtaining Routinely Available Materials

The Private Radio Bureau sets forth the following procedures for members of the public wishing to obtain routinely available applications and authorizations located at Gettysburg, Pennsylvania Licensing Division, including, but not limited to, all applications for new, modified, renewed or reinstated authorizations in the Land Mobile, Microwave, Aviation Ground and Marine Coast Radio Services and historical microfiche relating to authorizations in those radio services.

These materials will be available at the Commission's Gettysburg Public Reference Room, see 47 C.F.R. Sec. 0.453 (1), pursuant to Section 0.460 of the Commission's Rules, 47 C.F.R. Sec. 0.460 (Requests for inspection of records which are routinely available for public inspection). Consistent with subsection 0.460 (i) of that rule, the materials will be made available at the earliest possible time.

The Public Reference Room in Gettysburg maintains a Request Log which allows up to 24 files to be requested each day "over the counter." Each requester is permitted up to three requests pr day until 4 p.m. If the Request Log is not filled at 4 p.m., any requester may fill the remaining request spaces in the log on a first come, first served basis.

Generally the research time required by the staff to retrieve up to six requests is less than an hour an therefore no research fee is incurred. However, if more than six records are requested by the same requester in the same day, a research fee may be incurred depending on the nature and complexity of the materials to be retrieved. In such cases the fee would be calculated in accordance with section 0.0467 of the Commission's Rules.

The Licensing Division Staff will fill all requests as soon as possible. The Public Reference Room is open weekdays from 8 a.m. to 4:30 p.m.

Any change to these procedures will be made only after initiation of notice and comment rulemaking.

Questions regarding these procedures should be directed to the Licensing Division Consumer Assistance Branch at (717) 337-1212.

FCC Amends Part 90 Of The Rules To Allow Private Carrier Paging Licensees To Provide Service To Individuals

The Commission has amended Part 90 of the rules to allow private carrier paging (PCP) licensees to provide service to individuals. This action will promote competition in the paging industry, thereby increasing the variety and quality of services available to individual paging customers.

Currently, Part 90 of the rules authorizes PCP licensees to offer paging services available to individual paging customers.

Currently, Part 90 of the rules authorizes PCP licensees to offer paging services on a commercial basis, but only to end users who are themselves eligible for licensing under Part 90 and to the Federal government. Because Part 90 eligibility is limited to businesses, state and local government agencies, public safety organizations, and other defined entities, private individuals who do not qualify as business licensees are not eligible for a Part 90 license and therefore, are not allowed to obtain paging service from a PCP system. The effect of the rule is to prevent individuals seeking paging services for a non-business purpose from obtaining that service from a private carrier, thus limiting their service options.

The Commission concluded that allowing PCP licensees to provide service to individuals for non-business as well as business purposes serves the public interest by eliminating an unnecessary regulatory restriction, increasing the alternatives in paging services available to consumers, and promoting improved technology and increased efficiency through competition.

Although commenters were generally supportive of amending the rules, some raised the question of whether allowing PCPs to serve individuals will blur the distinction between private and common carrier paging. The Commission has held, however, that under Section 332 of the Communications Act, private land mobile licensees may serve individuals as well as other eligible users without any change to their legal status.

Consumer Alert: Accessing Long Distance Carriers When You Travel

The Commission would like to remind all traveling consumers who wish to use a particular long distance carrier or Operator Service Provider (OSP) that they should contact their carrier of choice for dialing instructions before leaving home. Consumers may utilize access codes to guarantee that they reach their preferred long distance carrier or OSP when using payphones or other telephones available to the public at "aggregator" locations, including hotels, motels, hospitals, resorts, airports, gas stations, campgrounds and convenience stores.

Three types of access codes can be employed by consumers to access their carrier of choice—"800" and local "950" access numbers or five-digit "10XXX" equal access codes. Federal law requires all aggregators to allow access via 800 or 950 numbers. The Commission has acted to ensure consumers' access to their preferred carrier by requiring pay telephone owners to allow 10XXX access. Other aggregators are phasing in this form of access according to a schedule set by the Commission.

Consumers may have difficulty reaching their carrier of choice from some locations other than payphones, such as hotel or motel room phones, because some of these locations may not currently allow 10XXX access. When this occurs, consumers may access their preferred OSP through the use of 800 or 950 access numbers, which the Commission has required OSPs to estab-

lish. The use of the 800 or 950 access numbers will provide an access method for consumers where 10XXX access is temporarily unavailable.

Enforcement Of Certain SMR Rules Suspended

The Commission has suspended enforcement of its recently adopted rule that Specialized Mobile Radio (SMR) licenses cancel automatically if a licensee discontinues station operations for more than 60 consecutive days, without FCC authorization. Under revised Section 90.631 (f) if the Commission does not authorize additional time, the license cancels automatically unless the station resumes operations within five days after the licensee receives the Commission's letter declining to authorize additional time.

The enforcement was suspended pending FCC action on a petition by the American Mobile Telecommunications Association, Inc., seeking reconsideration of the revised rule.

Propose New Technical Specifications For All ILS And VOR Receivers On Board U.S. Aircraft

The FCC proposed to implement new technical specifications for all Instrument Landing System (ILS) and VHF Omnirange Range (VOR) receivers on board U.S. aircraft. The proposed technical standards would increase the safety of international aviation and meet U.S. obligations under the International Civil Aviation Organization (ICAO) Convention.

Most commercial aircraft and many general aviation aircraft are equipped with ILS and VOR systems. These aids to air navigation are an integral part of modern aviation as they improve the ability of aircraft to navigate in poor weather. The use of these systems greatly increases the reliability, safety and efficiency of aviation. Therefore, the Commission has proposed to adopt standards for ILS and VOR receivers and the deadlines for meeting the standards as set forth by ICAO.

Specifically, the Commission has proposed to implement the ICAO standards for all U.S. aircraft according to the following timetable:

•January 1, 1994—all ILS and VOR receivers manufactured in or imported into the U.S. must meet ICAO standards;

•January 1, 1995—all newly installed ILS and VOR receivers on board U.S. aircraft must meet ICAO standards;

•January 1, 1998—all ILS and VOR receivers on board U.S. aircraft engaged in international flight must meet ICAO standards. Domestically, no aircraft may operate under instrumental Flight Rules unless ILS/VOR receivers meet ICAO standards; and finally,

•January 1, 2005—all ILS and VOR receivers on board U.S. aircraft must meet ICAO standards.

In order to ensure that ILS and VOR receivers meet the new standards, the Commission proposed that ILS and VOR receivers be authorized pursuant to the Commission's equipment authorization program.

In accordance with the FCC rules, notification is the appropriate method for applying for equipment authorization. Notification is a type of equipment authorization issued by the Commission whereby the applicant makes measurements to determine that the equipment complies with the appropriate technical standard and reports that such measurements have been made and demonstrate the necessary compliance. Submittal of a sample unit or representative data demonstrating compliance is not required unless specifically requested by the FCC. The procedures for application for equipment authorization are contained in Subpart J of Part 2 of the Commission's rules. The Commission has proposed to use the test procedures defined by RTCA's (an association of aeronautical organizations of the United States from both government and industry) Minimum Operational Performance Standards for ILS and VOR receivers as the basis for applications for equipment authorization.

Comments are requested regarding these proposals.

FCC Initiates Proceeding To Prepare For The 1993 World Radiocommunication Conference

The Commission initiated a proceeding to prepare for the 1993 International Telecommunication Union (ITU) World Communication Conference (WRC-93). WRC-93, the first conference under the new plan for scheduling WRCs biennially, will meet November 15 through 19, 1993, in Geneva, Switzerland. The information obtained in this proceeding will aid in determining United States' positions on issues at WRC-93, including whether the United States will seek to place specific issues on the WRC-95 and WRC-97 agendas, and if so, its position on these issues.

In December of 1992, the ITU Additional Plenipotentiary Conference (APP) adopted a major restructuring of the ITU. The APP recommended the WRCs convene every two years, beginning in November 1993. The ITU Council proposed that WRC-93 recommend issues for the 1995 and 1997 WRCs. In addition, it directed that WRC-93 consider scheduling two specific topics for inclusion on the agenda for WRC-95. They are: (1) a review of the Radio Regulations, and (2) facilitating use of frequency bands allocated to the mobile-satellite service. The Council's recommendations for WRC-93 were subsequently adopted by member administrations. Consequently, the Commission is seeking information and comment relating to telecommunications issues to be addressed at future WRCs.

In addition to the two issues the Council recommended for inclusion on the WRC-95 agenda, the Commission identified additional issues for possible inclusion on the agendas of WRC-95 and WRC-97. They are: (1) satellite digital audio broadcasting; (2) wind profiler radio systems; (3) space sciences services; and (4) high frequency broadcasting. For each issue, interested parties are asked to address whether and how the United States' interests will be served by placing it on the agendas of WRC-95; WRC-97, or a later WRC. Parties are also invited to suggest new issues for inclusion on future WRC agendas in addition to those listed.

Finally, the Commission noted that there are many Resolutions and Recommendations (RES/RECs) from past conferences (beginning approximately with WRC-79) that remain unresolved. Since WRCs will be held biennially, the Commission will begin planning for the placement and disposal of the RES/RECs by future conferences. Therefore, the Commission invites comment from knowledgeable parties on the appropriate timeframe for considering these items at upcoming WRCs. ■

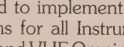
1-800-666-0908

New Equipment Orders & Prices Only, Please

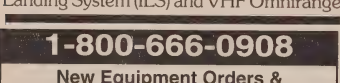
Shortwave Radios

Sony® • All Popular Models Including The ICF2010, SW55, And The New SW77 • Philips DC777 AM/FM/CASS/Shortwave Car Radio • Sangean • ICOM • JRC • Panasonic • Yaesu, **New FRG-100** • And the Superb

Drake R8



Grundig Satellit 500



Grundig Satellit 700

Scanning Radios

Featuring AOR Models AR1000XLT and AR3000A • ICOM R1, R100, and R7100 • Uniden Bearcat - All Models

Amateur Radio Equipment

Factory Authorized Dealer For:

ALINCO · STANDARD · KENWOOD · COMET · YAESU · MFJ · DIAMOND ANTENNA · ICOM · cushcraft

Accessories, etc.

• Call For Our Low Discount Prices •

For info and tech help call (203) 666-6227

Out-of-State Sales Call 1-800-666-0908

Conn. Sales Call (203) 667-9479

LENTINI COMMUNICATIONS, INC.

21 Garfield St. Newington, CT 06111

C.O.D.'s OK – SAME DAY SHIPPING

CIRCLE 69 ON READER SERVICE CARD

BY GERRY L. DEXTER

CLANDESTINE COMMUNIQUE

WHAT'S NEW WITH THE CLANDESTINES

Another chapter in the long, long story of oddities tied into clandestine broadcasting is currently being written. Suddenly, after years without much of a reaction, Cuba seems to be trying to jam several of the stations beaming anti-Castro programming to the island.

One of the first to spot this situation was clandestine expert George Zeller of Ohio who noted a heterodyne appearing next to the signal of Radio Caiman on 9965. Zeller says the interference is a sort of a whine, made up of two or three individual and simultaneous heterodynes. The jamming is also being applied against La Voz de CID on 9441.6, as well as against at least one of the anti-Castro programs being carried on WHRI (9495) at 0230 UTC and various other such broadcasts carried over WRNO.

Zeller notes that the jamming efforts are not particularly effective and that the programming can still be easily heard. That makes sense, since most of the broadcasts are beamed at rather high power and the jamming transmitters don't appear to be right on the broadcaster's frequency. The jamming, says Zeller, does not appear to be present when the U.S. commercial stations such as WRNO and WHRI are airing other non-Cuban programs. Readers might want to check the situation for themselves and see if the situation continues.

The National Radio for the Democratic Arab-Saharan Republic, mentioned last time, continues to be fairly widely heard on 11520. As noted before, the broadcasts speak on behalf of the Polisario Front which wants to run the Western Sahara (formerly Spanish Sahara). The latest schedule announced is 0700 to 0000. Some are hearing the station running from 1700 to 0000 so it's possible the station may be running a "split" schedule. All programming is in Arabic. The station is believed to be operating from the Tindouf region, inside Algeria, near the Algeria-Western Sahara border or perhaps within the area the Polisario controls in the Sahara itself. The 11520 outlet is heard quite well, at least in the eastern part of North America, up until it closes down at 0000.

Based on the Cambodian clandestine radio situation one has to wonder how well all the factions are going to work together now that the elections are over. The Khmer Rouge-backed Voice of the Grand National Union of Cambodia (a station created by merging the Voice of Democratic Kampuchea and Voice of the National Army of Democratic Kampuchea) never did close its operations, despite an agreement to do so which it made with the other factions. It continues to broadcast on 5408 from 2330 to 0000, 0800 to 1000 and 1200 to 1500 in Khmer and Vietnamese.

The station of the Prince Sihanouk coalition, Voice of the Khmer, did adhere to the agreement and close down sometime ago But it has now resumed operations on 6325. We don't have a schedule but checks during its former 0800 to 1400 segment might well produce a "catch." This station was heard far more often than the 5408 outlet, which was rarely, if ever, reported by North American monitors.

Radyo 16 Desann

Radyo Rezistans ak Mobilizasyon pouk mas yo

Radyo 16 Desann transmit every day :

	(Time)		
Monday to Friday	from 08:00 to 09:00 A M	7315 kHz	41 m
	" 18:00 " 19:00 P M	17835 kHz	16 m
Saturday	" 19:00 " 20:00 P M	7355 kHz	41 m
(until April 17th,1993)	" 19:00 " 20:00 P M.	7355 kHz	41 m
Sunday	" 07:00 " 09:00 A M	9850 kHz	31 m

Washington, April 5th, 1993

Sir,

We have received your letter and thank you for your interest in Radyo 16 Desann.

Radyo 16 Desann is the radio station of the legitimate government of the Republic of Haiti which has been forced to broadcast outside of haitian territory since a bloody military dictatorship was installed in Haiti in September 1991.

The coup d'état against President Jean-Bertrand ARISTIDE who was democratically elected by 67.7% of the electorate on December 16, 1990 has completely blocked the transition to and consolidation of democracy in Haiti.

Our radio station is one of the ways in which the haitian people and President Aristide are fighting for the return to constitutional legitimacy and the restoration of democracy in our country.

With the hope that you will continue to listen to Radyo 16 Desann, and support the efforts of the haitian people, we thank you once again for your interest.

The Direction of Radyo 16 Desann,
Louki Yves CAL

R.C. Watts of Kentucky received this QSL letter from Radio 16 Desanm, which represents ousted Haitian president Aristide.

Gordon Darling, reporting from Papua New Guinea to the Ontario DX Association, says that Radio Free Bougainville is definitely off the air. Darling says that Radio Free Bougainville used a Yaesu ham transmitter running only 50 watts. So it's hardly surprising that this station, which fits the description of a "classic" type clandestine broadcaster, was never heard in North America, at least not to our knowledge.

Marie Lamb in New York says she's heard the Colombian clandestine, Radio Patria Libre, on 15050 upper sideband at 0144—which is well past their normal 0110v sign off. Indeed, the broadcast didn't close until 0200.

Another Lamb log was the Voice of Human Rights and Freedom for Iran (formerly Iran's Flag of Freedom) at 1641 to 1704 on 15620. Marie reports their schedule as 0228 to 0425 on 9350 (hearable under WCSN) and 11470. Also at 0645 to 0730 on 11470, 15100 and 15670; 1400 to 1445 on 15100 and 9250 and 1630 to 1825 on 11470, 15100 and 15620. The sign on, at least for the 1630 transmission, includes an ID in three languages, including English.

For our money, clandestine radio is one of the most intriguing aspects of the radio hobby. Your editor will be giving a talk on clandestine radio broadcasting and monitoring at the *Pop'Comm* WorldWide SWL Conference in Virginia Beach, Virgina the first weekend of October and would be delighted to find you in the audience!

Remember to let us have your clandestine loggings, copies of QSLs, QSL and address information, as well as any background material, news clippings or other related information you may come across. Join us again next month for more on the secret world of clandestine radio! ■

CB SCENE

BY BILL SANDERS, SSB-295

27 MHz COMMUNICATIONS ACTIVITIES

Uniden's PRO 320XL portable handheld CB is a multi-purpose unit. On the road, it's a full power self-contained transceiver that is complete and ready to use for getting traffic information. With the battery pack, it can be an essential emergency CB during car trouble. Small enough to fit anywhere, the PRO 320XL is well suited for sports, recreational, and other outdoor applications.

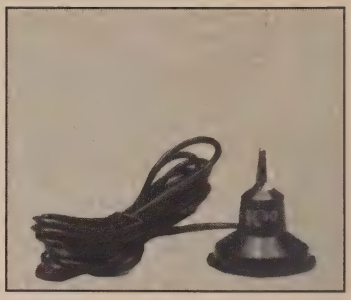
Features include up/down electronic channel keys, a key for instant access to CB Channel 9, belt clip, heavy duty power cord with mobile cigarette lighter plug, and a snap-on battery pack. The MSRP of this unit is $119.95. It's available through Uniden's large dealer network.

Another new product we received information about is the K30 mobile antenna. It's from the makers of the K40 mobile antenna. The press release tells that the new K30 has a sturdy 3-inch magnetic mount for a strong grip. Not that anybody hopes you'll be pushing it to its limits, but the K30 mount has been tested to retain its magnetic strength beyond speeds of 120 m.p.h.

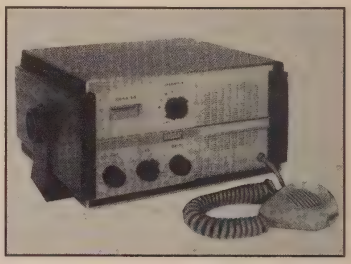
Installation is simple with mag-mount antennas. That's because no holes need to be drilled in vehicles. Maggies can easily be moved from one vehicle to another, or conveniently stowed when not needed.

For more information on the new K30 antenna, contact K40 Electronics, 1500 Executive Drive, Elgin, IL 60123.

Uniden offers this new PRO 320XL multi-purpose handheld CB.



The K30 is a newly designed magnetic-mount CB mobile whip.



Webster's 440 was a beautiful 10-channel CB radio that came out back in 1964.

A Look Back

Taking a look at an antique CB radio this month, we'll see the *Band Spanner 440*, which was available beginning in late 1964 by Webster Manufacturing Co., South San Francisco, Calif. Like many other Webster products, this CB was most likely primarily intended for ship/shore marine users.

The Webster 440 was a classy, and very attractive transceiver. It had 10 transmit/receive channels, plus a tunable dual conversion receiver. With its 0.5 uV sensitivity, sharp selectivity, AVC, ANL, panel meter (output/modulation/received signal strength), 117VAC/12VDC power supply, it was as sophisticated as CB radios got almost 30 years ago. Not only that, it also looked great.

In an era when most CB radios were drab boxes with sharp corners, the Webster 440 had a blue and orange front panel. The metal cabinet's sides were covered with polished grained walnut.

Report From Overseas

Michael is 20 years old, and has been living in Chicago for several months. He's a Sidebander, and originally from the Philippines.

He informs this column that CB is under a ban in the Philippines and the government has stopped issuing licenses. Only radio clubs affiliated with the government or the military may use CB. One such group is the CARRIER (Citizen Assistance for Rescue, Relief, Information, and Emergency Relay), and I am a member.

The CARRIER is an organization of volunteers who render assistance to the general public by participating in rescue operations and relief projects. Also, by disseminating information and emergency data over CB Channel 11.

Michael arrived in the USA last February, and that's when he discovered *POP'COMM*. Has been a devoted reader ever since.

Michael's address: Michael G., 5614 N. Christiana, Chicago, IL 60659.

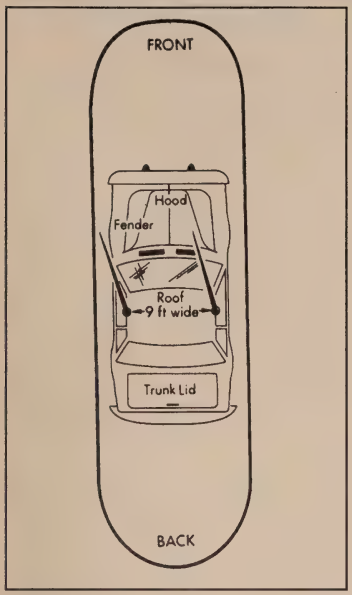
Local Frequency Information

Captain D.O. Buck, SSB Network Member SSB-87M, who is stationed at the Canadian Forces Base Trenton, Ontario, kindly passed along frequency information.

He advises that in the Trenton/Belleville area of Ontario, truckers on Highway 401 (which is the major East/West artery) normally use Channel 19, although there are French-Canadian truckers on Channel 12.

There is a very active local CB club in the area using Channel 14 as their call frequency. They meet the first Tuesday evening of every month. Members also like to use Channels 29 and 31.

He has a mobile Uniden PC-122 and a base unit. The base unit is a Cobra 148GTL mobile unit run from a fixed location. He has been involved in communications hobby since 1974. Today, he's into sideband-ing, CB'ing, scanning, and SWL'ing (a DX-440). He likes *POP'COMM* because, he says, it's "broad enough to cover a wide range of interests." Also, he feels," this is



Signals go front/rear with a properly installed co-phased antenna system. This car, of course, is 9 ft. wide. Most cars are narrower. For vehicles that don't allow for 9 ft. whip separation, the system doesn't work so well. See text.

a refreshing change from some publications whose tone seems to imply that if you haven't got $10,000 to invest in the latest computer-aided scanning equipment, you just aren't worth writing for."

Capt. Buck, your information and kind words are appreciated. Here, we never forget that communications is one of the few hobbies able to produce results and enjoyment for those who don't invest a lot of money. While we love the latest big bucks high-tech approaches, we have also found that the time tested and less costly ways of the hobby continue to offer their own unique pleasures and benefits.

Gilbert M. Weiss, of Auburndale, Fla., asks how to get information on becoming a member of the SSB Network. For an application, send a self-addressed, stamped (US 29 cent), long return envelope to SSB Network, P.O. Box 381, Smithtown, NY 11787.

Polecat, of Lawrence, Kansas observes that it doesn't sound as if there is as much trucker chatter on Channel 19 as there used to be. He wonders if others have also noticed this. Yes, and for quite a while. What happened? Of the 50 largest trucking companies operating in 1978 (when truckers virtually ruled Channel 19), only 9 still remain in business.

Just A Phase

No doubt about the fact that mobile CB operators are impressed with having dual antennas sprouting from their vehicles. Many CB-equipped pickups and other trucks have dual, or *co-phased* antennas. Because of the number of requests for information on the purpose and possible advantage of these antennas, now is a fine time to go over this. You may be surprised to learn that co-phased antennas are quite different than you have been lead to understand or believe.

When properly oriented and spaced (this point is critical), a pair of co-phased mobile whips will work together to concentrate the signal towards the front and rear of a vehicle. This makes them like a mobile beam antenna.

A proper co-phased system consists of a pair of identical and carefully matched-load whips, and also a precisely manufactured co-phasing "harness" that connects both antennas to the CB set. This harness is a pair of equal length (about 18") coaxial cables that are joined together at one end. The exact length of the harness creates the proper impedance match to the CB radio so that identical, in-phase, signals are delivered to both whips.

If the two whips are mounted a quarter-wave apart (about 9-ft.), the signals they radiate will interact in a way that cause them to have signal lobes towards the vehicle front and rear, with nulls towards the sides of the vehicle. In the event the whips are mounted closer together than a quarter-wave, the signal pattern distorts to favor radiation towards the sides of the vehicle at the expense of the front and back. This is a less desirable signal configuration since you want to hear and communicate with oncoming vehicles.

What this means is that, unless you have enough room to properly space out the required nine feet separation, then co-phased antennas aren't going to do anything useful for you. If you have a large RV, or an 18-wheeler, especially with outrigger sideview mirrors, then you're in business.

Otherwise, co-phased whips look sharp, but they are not at all desirable either on back country roads or the superslabs. What you need is an omnidirectional antenna.

We have seen some co-phased whip installations on cars where one whip is mounted towards the front and the other towards the rear of the vehicle. Because the whips are only about four feet apart, the signal is (theoretically, at least), shaped towards the front and rear. However, the complexity of these installations has never provided any significant communications improvement towards the front of the vehicle over a good omnidirectional antenna mounted towards the rear of the vehicle.

If you feel your vehicle is properly sized to be a candidate for a co-phased antenna system, your area CB communications shop should be able to supply dual matched whips, mounts, and the co-phasing harness. If you haven't got nine feet to play with, stick with a *stick*.

That's our nickel's worth. We'll be looking for your QSL cards, letters, local channel data, thoughts, and anything to do with 27 MHz activities. ■

QSL from The International Springbok group, of the Rep. of South Africa. (Courtesy Michael G., Chicago, Ill.)

Beaming In: *(from page 4)*

tion. The FCC claimed it had tape recordings of the unauthorized transmissions. The FCC said it had received interference complaints from Stevenson's neighbors.

After receiving the NAL, Stevenson, under the Freedom of Information Act (FOIA), asked that the FCC make available the complaints brought against him. He also requested all FCC communications and claimed tape recordings. The agency denied him this evidence.

This past June, Stevenson reiterated his request, complaining that the FCC's denial had deprived him of necessary information concerning the informants in question. The FCC stuck to its position. In the FCC's Report No. GN-135 of June 23, relating to Stevenson's request, the agency was maintaining that Exemption 7(D) of the FOIA authorizes the holding back of "certain information regarding the identity and/or identifying data of confidential sources of information obtained during the course of law enforcement activities." The FCC claimed that 12 of the complainants specifically asked for confidentiality, and the remaining complainant furnished information "under circumstances where confidentiality could be reasonably inferred." The FCC told Stevenson that providing him with the materials he might be able to use to know who his accusers "would undermine the agency's investigative and law enforcement efforts."

I'm not an attorney, but somehow it seems that while there are some of the window dressings of a trial, these activities are stacked against the public. They aren't in courts of law. There are no judges, juries, or broken laws. What is being decided relates only to whether any FCC regulations were violated, as alleged by the FCC. The presumed-guilty citizen can try to prove innocence, and this is decided by a hand-picked FCC employee issuing decisions within the FCC's own privately run justice system. Remember, the amount of the fine and the verdict of apparent guilt has been established right from the outset. Does little to inspire confidence!

Take it to a higher "court"? Sure! There is even a parody of a Court of Appeals. An appeal of the hearing decision may be entertained, but is decided upon by the FCC Commissioners. FCC Commissioners are appointed to their positions as political patronage. They can get appointed without knowing the difference between a frequency band and a rubber band.

One person being considered recently for appointment as Chairman of the FCC was an attorney who had experience in the field of communications. The candidate volultarily withdrew from consideration after questions were raised about this attorney's participation in a 1980's partnership that received a $2-million settlement to withdraw its offer to purchase a Washington, D.C. FM station. While this didn't violate any FCC regulations, this type of dealing is frowned upon by the agency. The attorney denied that the matter had any impact upon the decision to withdraw from consideration, citing personal and career reasons.

Another candidate being simultaneously considered was a staff member of the House Energy and Commerce Committee.

Still, we say, if it looks like a trial, sounds like a trial, and smells like a trial, then it is a trial. No matter how they slice and dice the words, I believe that the citizen showing up for one of these proceedings certainly must perceive that some sort of a trial is taking place. Problem is, it's a nightmare Big Brother world where the wheels of justice are turning in reverse.

And, let's not forget that in 1991 the FCC substantially increased the amount of its fines. The fines jumped to astronomical sums. They went far beyond being fair or reasonable for the violations cited. Most were more than individuals or the majority of companies could pay and remain solvent. In the main, the revised fines were oppressive, cruel, unrealistic, and completely insensitive to the public. In a word, they were an outrage.

A broadcaster that the FCC said failed to respond to FCC communications might be fined $17,500 for each day the agency claimed the violation continued. A police communications station failing to give the proper station ID could be fined $1,000 for each day the agency claimed there was a violation.

Broadcasters failing to file the proper FCC forms could be fined $7,500 per day as long as the agency claimed the violation continues.

There were even some chuckles. Why didn't FCC list any fines for Cellular stations that allowed the transmission indecent or obscene language? Yet broadcasters were listed for $12,500 per day, and everybody else at $5,000 per day. Who said the FCC had no sense of humor?

You can see that these fines are preposterous. Imagine a small broadcaster, ship owner, police agency, or other licensee being informed that a federal agency has suddenly dropped one of these toxic fines on them and that that they would have to either pay up or go to the time, trouble, and expense of proving their innocence.

Last April, in the face of many complaints, the FCC agreed to consider lowering at least some of its broadcast fines. Several had already been reduced. However the FCC was also thinking about a few that might be further increased. Although the FCC has contended that the fines help ensure broadcaster compliance with regulations, the National Association of Broadcasters has often stated its opinion that the fines are primarily a way of bringing in revenue.

Broadcasters also complain that when they attempt to defend their innocence in an FCC indecency/obscenity complaint, the agency's process drags out for too long a period. In all, this may involve several years, and even longer in instances when broadcasters have refused to pay the fines the FCC has determined that they owe. At that point, the matter is turned over to the Department of Justice, where it will eventually end up in a real court of law. But that takes another three years.

This seems like a long and expensive way to get heard by a real judge in an actual courtroom. I always thought that our Constitution was set up to prevent governmental agencies from denying citizens certain basic rights. The FCC is probably not the only federal agency that hands out fines for violations of its regulations, then enforces them in a manner similar to this.

Federal laws are created by people that we can vote into office, and then later can kick out if we realize they are idiots. But bureaucrats who create and enforce regulations aren't elected, they are civil service employees who can hold onto their jobs for decades whether or not anybody likes their regulations. FCC Commissioners are political appointees. Therefore, I am uncomfortable when regulations created by these folks are palmed off, enforced, and prosecuted as if they were federal laws.

Furthermore, I don't think it's right when individual federal agencies are allowed to short-circuit Constitutional guarantees by changing a few of the trappings in order to set up bogus internal court systems to enforce their own regulations. This is especially true when the fines they issue before any trial ("hearing") always run to thousands of dollars, and where citizens are presumed guilty and are expected to pay unless they are able to prove themselves innocent.

Certainly the FCC requires regulations for its licensees. Obviously, there must be a mechanism for enforcing those regulations. Still, it seems to me that this present system has serious flaws that are grossly unfair, and that ignore the Constitutional guarantees we all expect, including the presumption of innocence until proven guilty. If he only knew what was going on, Thomas Jefferson would be taking *Maalox*.

We would like to know your views on this. ■

COMMUNICATIONS SHOP

Advertising Rates: POP'COMM subscribers are entitled to one FREE 30-word non-commercial classified ad per year. Enclose subscription name label with ad copy. For those people not in the previously mentioned group, non-commercial ads are 30 cents per word, including abbreviations and addresses; minimum charge $6.00 per issue. Ads from firms offering commercial products or services are $1.00 per word; minimum charge $20.00 per issue. Boldface words are $1.20 each (specify which words). Leading key words set in all caps at no additional charge. All ads must be prepaid in full at time of insertion; a 5% discount is offered for prepaid 6 time insertions. All ads must be typewritten double spaced.

Approval: All ad copy is subject to Publisher's approval and may be modified to eliminate references to equipment and practices which are either illegal or otherwise not within the spirit or coverage scope of the magazine.

Closing Date: The 10th day in the third month preceding date of publication. Because the advertisers and equipment contained in Communications Shop have not been investigated, the Publisher of Popular Communications cannot vouch for the merchandise listen therein. Direct all correspondence and ad copy to: PC Communications Shop, 76 N. Broadway, Hicksville, NY 11801.

TOMCAT'S BIG CB HANDBOOK, by Tom Kneitel. 221 large pages, fully illustrated. Complete guide to worldwide AM, SSB, Freeband, 27 MHz operations. Everything they never told you (legal & otherwise) from world's leading CB authority. Only $13.95 plus $4.00 postage ($5.00 to Canada) from CRB Research Books, Inc., PO Box 56, Commack, NY 11725. (NYS residents add $1.53 sales tax).

TUNE In On Telephone Calls. Revised and Updated Edition! Tom Kneitel's new 160-page book. Everything you need to know to effectively use a scanner and communications receiver to eavesdrop on private telephone calls from homes, offices, cars, ships, aircraft, trains. Explanatory text, photos, extensive listings section covers USA/Canada on HF, VHF, UHF, and above; thousands of locations, frequency assignments. Explains equipment, best techniques, laws regarding monitoring cellular, cordless, ship/shore, high seas, Air Force 1, airliners, 1-way paging, more. Only $12.95 plus $4.00 postage ($5.00 to Canada) from CRB Research, PO Box 56, Commack, NY 11725. NY residents add $1.44 sales tax. Dealer inquiries invited. Visa/MC OK. Tel: (516) 543-9169.

WOW! UNDERSTANDING & REPAIRING CB RADIOS by Lou Franklin. Giant 380-page technical book picks up where THE "SCREWDRIVER EXPERTS" GUIDE leaves off. Includes circuit descriptions and troubleshooting guide for virtually all CB radios: 23 and 40-channel , crystal and PLL, solid-state and tube, AM, FM, SSB, CW, American, British and export models. Covers test equipment, transistor basicsm synthesizers, receivers, transmitters, power supplies, T/R switching, antennas, interference, parts and accessory sources. Over 350 illustrations plus huge subject index. Moneyback Guarantee! Only $29.95 plus $3.50 U.S & Canadian Air Mail, VISA/MC accepted. Free catalog of unique CB books, plans, and modification kits with order. Catalog only $2. CBC INTERNATIONAL INC., BOX 31500PC, Phoenix, AZ 85046. Thousands of satisfied customers since 1976.

RADIO MONITORS NEWSLETTER OF MARYLAND FOR THE SERIOUS SHORTWAVE AND SCANNER LISTENERS. PO BOX 394, Hampstead, MD 21704. For a one year subscription: $15.00. Sample copy: one dollar.

Complete Law Enforcement Cellular phone monitoring guide. All methods of attack, frequencies, channels, base, spacing, increment search, cell search, phone number target interception. Free equipment catalog with order. $21, Operative Supply, PO BOX 2343C, Atlantic Beach, NC 28512.

SCANNER MODIFICATION HANDBOOK VOL.1 by Bill Cheek ("Doctor Rigomortis"). The original 160-page book. Performance improvement modifications. Simple step-by-step instructions, many photos. Primarily PRO-2004 & PRO-2005, some for PRO-34, BC-200/205XLT, BC-705XLT, BC-705XLT. Restore blocked-out bands, speed up scanning rate, disable "beep," increase number of channels, improve squelch action, add an S-meter, interface with shortwave receivers, etc. Make the PRO-2004 & 2005 into a 6,400 channel scanner; put 3,200 channels into the PRO-34! Plus, cellular frequency charts, antenna info & mods, inside info on frequency management, operating hints, emergency power supplies, scanners & the law, lots more! Only $17.95, plus $4.00 shipping ($5 to Canada). Residents of NY State add $1.87 tax. **Big 220 page VOL. 2** with more mods for PRO-2004/5/6, PRO-34, PRO-2022, BC-760/950XL, BC200/205XL, now available, $17.95 plus $4.00 shipping ($5.00 to Canada). NY State residents include $1.87 tax. If both books are ordered at the same time, send only $4.50 shipping, ($5.50 to Canada). Order from CRB Research Books, Inc., PO Box 56, Commack, NY 11725. Visa/MC welcom. Tel: (516) 543-9169.

CW? NO PROBLEM. You can increase your speed, no matter how many times you've failed before. **Results guarateed** when you follow the instructions. PASS Publishing's CW Mental-Block Buster program helps you **explode mental blocks** that hold you back. Based on 40 years of research, the **CW Mental-Block Buster** uses guided meditation, dynamic visualizations, and powerful affirmations to blast through mental blocks. **You can do code!** That means new bands, more contacts, more fun! (This is not a CW practice tape.) The **CW Mental-Block Buster** audio cassette and practice booklet are only $29.95 ppd. in the US (NY residents add $2.08 sales tax). (Quantity discounts available for classes.) PASS Publishing, PO Box 570, Stony Brook, NY 11790. VISA, MC, COD: 516-584-8164; FAX: 516-584-9409.

New 8th Edition, Kneitel's "Top Secret" Registry of U.S. Gov't. Radio Frequencies! Giant 268 page book; largest amount of fed agency comms data ever published in 1 book. Includes worldwide American mil bases, FBI, DEA, Secret Service, Customs, ATF, Immigration, US Marshals, FCC, FAA, EPA, USCG, CIA, Border Patrol, IRS, State Dept, Dept. Agri., Nat'l. Parks, Postal Service, GSA, lots more, plus UHF aero. Also, Canadian listings, foreign gov't mil listings for Caribbean, Latin American, & Mideast hotspots. New key-freq. VHF/UHF index section. The ultimate insiders' scanner directory! Plenty of HF freq. info, too. Lots of new & updated data. All for $21.95, plus $4.00 shipping/handling (Canada $5.00). Residents of NY State please add $2.21 tax. From CRB Research Books, Inc., PO Box 56, Commack, NY 11725. VISA/MC accepted. Tel: 1-(516) 543-9169.

PROFESSIONALS' CHOICE!

TIRED OF TOYS? The **VX-100** *crystal-controlled* miniature FM transmitter uses **surface mount technology** to let you hear every sound in your home up to 2 miles away on any programmable scanner or VHF surveillance receiver! The complete device is only slightly larger than a 9V battery *with the battery installed!* The **VX-100** is sensitive enough to pick-up a whisper from across a large room and is *guaranteed* to outperform VHF surveillance transmitters selling for hundreds of dollars. RF power is **100mW output** with a 9V battery for long range even under adverse conditions. Automated assembly of surface mount components and *simple 5 minute assembly* by the user allows the price of the **VX-100** to be a fraction of the cost of even lower quality units. Assembly consists of attaching 3 wires to the transmitter module. Each unit is pre-tested, pre-aligned and comes complete with instructions and a **30 day unconditional moneyback guarantee!** Use it for a month. If you don't like it for any reason, return for a courteous refund. The **VX-100** is available on 3 surveillance transmitter frequencies; **A** 139.970MHZ, **B** 140.00MHZ, **C** 139.940MHZ. Channel **B** shipped unless otherwise specified. Custom frequencies available by special order. Only **$79.98+$2.00 S&H** or buy **2 for $75 each** with free S&H. VISA, MC, MO, for immediate shipping. **COD** orders add **$5.00.**

Crystal Controlled! *Uses standard 9V battery*

DECO INDUSTRIES BOX 607 BEDFORD HILLS, NY 10507 914-232-3878

CIRCLE 61 ON READER SERVICE CARD

212-925-7000

SHORTWAVE RECEIVERS, HAM RADIOS, BOOKS ANTENNAS, SCANNERS, Business Radios. MOTOROLA, ICOM, YAESU, KENWOOD, SONY PANASONIC.

. . . our 40th Year . . . Worldwide shipping.

Sales . . . Service. Large Showroom. Open 7 days.

WE SHIP WORLDWIDE **Barry Electronics Corp.** WORLD WIDE AMATEUR RADIO SINCE 1950 Your one source for all Radio Equipment!

Fax 212-925-7001

512 Broadway, NYC, NY 10012

CIRCLE 54 ON READER SERVICE CARD

The Best in PC based High Quality APT Weather Satellite Imagery

Satellite Imagery

Low Price, Advanced Full-Featured Software and Hardware Solutions

☒ **Advanced Capture Board**

Removes Doppler bending
Self test modes verify operation
FCC Part 15 Class B certified
Contains both AM and FM decoders
Ultra fast 2us A/D converter
Automatic Gain Lock (AGL)
Maintains Frame Sync

☒ **Full Function Software**

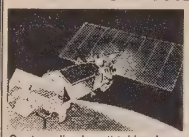
Stand alone animation
Ephemeris based worldwide geopolitcal map and latitude longitude overlay
Distance & direction measurement tool
Extensive image processing toolbox

OFS WeatherFAX High Performance Satellite Weather Facsimile

Phone/Fax (919) 847-4545

6404 Lakerest Ct., Raleigh, NC 27612 VISA

MARYMAC
The New Realistic® PRO-43 Scanner
Radio Shack®
Phones
Our 17th Year of DISCOUNTS
Freight prepaid, save tax
Toll Free 800-231-3680
PRO-43 List $349.95
Our Delivered Price $290.00
"We discount everything in the RS catalog"
22511 Katy Fwy.
Katy (Houston), TX 77450
1-713-392-0747 FAX 713-574-4567
CIRCLE 72 ON READER SERVICE CARD

SPY ON THE EARTH

See *live* on your PC what satellites in orbit see
Capture *live* breathtaking images of the Earth for fun or profit. Zoom in up to 20X. Send $39 check or M.O. ($45 air, $50 overseas) for our *fantastic* 12 diskette set of professional quality copyrighted programs (IBM type) that does satellite tracking, image acquisition, image processing, 3-D projections and more. Direct reception from the satellites guaranteed worldwide without a satellite dish. Schematics included for interface. For FREE information log-on to our bulletin board anytime at: (718) 740-3911.
VANGUARD Electronic Labs
Dept. PC, 196-23 Jamaica Ave.
Hollis, NY 11423 Tel.718-468-2720

SATELLITE TV
SATELLITE TV BUYING GUIDE
NAME BRANDS AT 50% DISCOUNT
This FREE 24 page Consumer Buying Guide tells all about Satellite TV and lists guaranteed lowest prices.
Satman, Inc.
6310 N. University No 3798 • Peoria, IL 61612
CALL FOR **1-800-472-8626**

HAND-HELD SCANNERS!
MetroWest is your source for:
Bearcat Hand-Helds
Double-Life Battery Packs
Drop-In Chargers
Specialty Antennas
Books
and more

Send for our free catalog
MetroWest, Inc.
822 N. Spring
LaGrange Park, IL 60525
(708) 354-2125
(800) 657-1475
CIRCLE 73 ON READER SERVICE CARD

MORSE CODE Got You Down? Why let a mental block stand between you and upgrading? Use PASS Publishing's **CW Mental-Block Buster** to **blast through those barriers.** Just follow the instructions for 30 days—Results Guaranteed! Based on 40 years of research, the **CW Mental-Block Buster** uses guided meditation, dynamic visualizations, and powerful affirmations to blast through mental blocks. **You can do code!** That means new bands, more contacts, more fun! (This is not a CW practice tape.) The **CW Mental-Block Buster** audio cassette and practice booklet are only $25.95 ppd. in the US (NY residents add $2.08 sales tax). (Quantity discounts available for classes.) PASS Publishing , PO Box 570, Stony Brook, NY 11790. VISA, MC, COD: 516-584-8164; FAX: 516-584-9409.

CW Lite is the **easiest** Morse Code training method in the world, bar none! And it is the **fastest,** too. Just closed your eyes and relax. This powerful **hypnosis cassette tape** does the rest. **Subliminals** speed you along! Only $15.95 ppd in US (NY residents add $1.28 tax). Order today! **PASS Publishing,** Box 570, Stony Brook, NY 11790. VISA, MC, COD: 516-584-8164; FAX: 516-584-9409.

CB RADIO HACKER'S GUIDE! Big 151 page book; pictorials, diagrams, text. Complete guide to peaking, tweaking, & modifying 200+ CB radios for enhanced performance & more features. Which screws to turn, which wires to cut, AM & SSB radios: Cobra, Courier, GE, Midland, Radio Shack Realistic, SBE, Sears, Uniden/President. Get the most from your CB radio & operations. Only $18.95, plus $4.00 shipping ($5.00 to Canada). NY State residents add $1.95 tax. Order from CRB Research Books, Inc., PO Box 56, Commack, NY 11725. Visa/MC OK. Tel: (516) 543-9169.

PAN-COM INT'L CATALOG. Over 350 Kits, Plans, Licensed/unlicensed. AM/FM broadcasting. Ham/CB/SW/DX, 1750M transmitters, Surveillance devices, Computers/Software, Science Projects, MORE! $1 refundable. Box 130-P08, Paradise, CA 95967.

COMMODORE 64 HAM PROGRAMS—8 disk sides over 200 Ham programs—$16.95. 29¢ stamp gets unusual software catalog of Utilities, Games, Adult and British Disks. Home-Spun Software, Box 1064-PC, Estoro, FL 33928.

SURVEILLANCE TRANSMITTER KITS tune from 65 to 305 MHz. Main powered duplex, telephone, room, combination telephone/room. Catalog with **Popular Communications, Popular Electronics and Radio-Electronics** book reviews of **"Electronic Eavesdropping Equipment Design,"** $2.00. **SHEFFIELD ELECTRONICS**, PO Box 377785, Chicago, IL 60637-7785.

NEW 1993 CB IMPORT/EXPORT RADIO CATALOG—Hard to find CB Dealers, Equipment, Modification Kits and Plans—$3.00. **LORD WYATT COMMUNICATIONS**, PO Box 030128PCJ, Brooklyn, NY 11203-0001.

THE SCANNER HACKERS BIBLE. 112 modifications. Includes: PRO-2004/5/6, Yaesu, Kenwood, Bearcat, Icom and others. Frequency fixes, modifications (scan rates, interfaces, programmable channels, improving operation, etc.), antenna plans, operation, laws, cellular telephone operation and frequencies, accessories, 10-codes and more. $33.45. CODs, 1-602-782-2316, or fax 1-602-343-2141. **TELECODE**, Box 6426-CQ, Yuma, AZ 85366-6426.

CANADIANS ONLY. Lowest prices, Bearcat-AOR, Uniden, Midland, Ranger, Galaxy, K40, Wilson, Antron, Valor, Sangean, MFJ, Diamond. Free Price List. Catalog $2.00. Cellular Communications, 83 Galaxy Blvd., Unit #39, Rexdale, ONT., M9E 5X6. (416) 675-0029.

SCANNER FREQUENCY SEARCH SERVICE. Hear all there is to hear! SAE to: Heald, 6886P, Jefferson, North Branch, MI 48461.

"PERMANENT MAGNET MATERIALS SHORT COURSE." Complete history, materials listing, glossary, specifications, applications, design criteria, sources. Details—$2.50, order refundable. SJL Publishing, Dept., A004PC, Hanna, IN 46340-0152.

SEXY? "The Real Spymart." Home office, cellular, defense, surveillance, nightvision, transmitters, more! Catalog—$5.00. Operative Supply, PO Box 2343C, Atlantic Beach, NC 28512.

CELLULAR HACKERS BIBLE. Theory—Hacks—Modifications—$53.95. Cellular Cloning Video-$39.95. Cellular Programmers Bible-$84.45. COD's: (602) 782-2316. FAX: (602) 343-2141. **TELECODE**, PO Box 6426-PC, Yuma, AZ 85366-6426.

CABLE TEST CHIPS. Scientific-Atlantic 8550, SA8500-310, 311, 320, 321 (specify)-$33.95. 8580-338—$69.95, 8570xxx, 8590xxx, 8590 (11 BUTTON)-$69.95. TOCOM 5503/07 VIP—$33.95. ZENITH ZF-1-$33.95. STARCOM 6 (except BB)—$33.95. STARCOM7 (except M1)—$49.95. STARCOM 7 (M1)-$109.95. CABLE HACKERS BIBLE-$53.95. CELLULAR CLONING VIDEO-$39.95. CELLULAR PROGRAMMERS BIBLE-$84.45. COD's: (602) 782-2316. FAX: (602) 343-2141. Catalog-$3. **TELECODE**, PO Box 6426-PC, Yuma, AZ 85366-6426.

KENWOOD & ICOM Service Bulletins. 175+ pages covering all models—$39.95. Catalog—$3.00. CODs 602-782-2316/FAX 602-343-2141. **TELECODE**, Box 6426-PC, Yuma, AZ 85366-6426.

VIDEOCIPHER II - Satellite - Scanner - Cable - Amateur - Cellular - Repair Manuals, Modification Books & Software. Catalog—$3.00. **TELECODE,** PO Box 6426-PC, Yuma, AZ 85366-6426.

CB, HAM, SWL DISCOUNT OUTLET. Cobra, Uniden, Phillips, K40, A/S, Larsen, Firestick, Valor. Many hard to find items. Catalogs $1.00. Mobile installations available at our retail store. Custom Auto Radio, Dept. P3, 660 Arsenal St., Watertown, MA 02173. Tel. 617-923-2122.

MEN OF ACTION AND ADVENTURE — Paladin Press has been described as "the most dangerous press in America." Millions of satisfied readers disagree. Outrageous and controversial books and videos on firearms, exotic weaponry, unconventional warfare, new identity, espionage and investigation, privacy, action careers and more! To order our 50-page catalog send $1.00 to: Paladin Press, Box 1307-3BP, Boulder, CO 80306. (303) 443-7250.

VIDEO SYNC GENERATOR. Restores Horizontal & Vertical sync lines from distorted analogue video formats. For Information on completed units & pricing write: R.C. Distributing, Box 552, South Bend, IN 46624. Phone: (219) 236-5776.

FOR SALE: Two Realistic CB walkie-talkies, model TRC-216. 40 ch., 5W. Uses Nicds or AAs. Includes carry case and wall charger, manual. Mint cond.—$100 each. Realistic 40 ch. AM/SSB mobile CB. Mint cond with bracket, mic and manual $135. Postal mo only! H. Ort, 270 Mechanic St., Red Bank, NJ 07701.

RADIO SHACK DEALER - Lowest prices all Radio Shack equipment. PRO-2006 - only $349; PRO-43 - only $279; PRO-37 - only $259; Sangean ATS803 - only $169; SONY 2010 - only $345. Order toll-free 1-800-848-3004. CoTronics, Inc., 2200 SE Federal Hwy., Stuart, FL 34994.

CELLULAR, 2-WAY, CB, SCANNER ANTENNAS for base, portable, mobile. High quality at discount prices. Price list $1 (refundable) **Radio Communications Services,** 1007 Eastfield, Lansing, MI 48917.

WANTED: R-390 receiver, especially model in use by Air Force in early '70's. Any condition. Stan Sullivan, PO Box 270, Montevallo, AL 35115. (205) 665-2065.

CQ Books and Videos

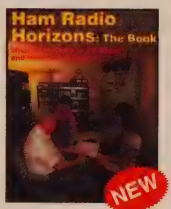
The Quad Antenna

Hams love antenna books and this book is no exception. Written by world renowned author Bob Haviland, W4MB, The Quad Antenna is the authoritative technical book on the design, construction, characteristics and applications of Quad Antennas. Discover how to easily build a quad antenna for your station that will help you fill your logbook with rare DX that you have only dreamed about before. **Order No. QUAD..... $15.95**

The Packet Radio Operator's Manual

This book is written by CQ columnist and Amateur Radio Packet authority Buck Rogers, K4ABT. An all new introduction and guide to packet operation, it is the perfect single source, whether you're an advanced user or just starting out. Learn about packet radio without all the technical jargon. Also included are detailed hookups for dozens of radio/packet controller/computer combinations, making this book the definitive resource for the active packet user. **Order No. PROM..... $15.95**

Ham Radio Horizons: The Book



Written by Peter O'Dell, WB2D, this is a book about ham radio that every beginner can enjoy! If you want to get in on the fun and excitement of Amateur Radio, Ham Radio Horizons is the perfect way to get started. HRH is full of tips from expert hams in: DXing, Contesting, Serving the Public, Ham Radio in Space, Experimenting, Digital Communications — you name it! This exciting book is an excellent gift to a prospective ham or for use in your club's licensing classes and library.
Order No. BHOR..... $12.95

The Vertical Antenna Handbook

Take advantage of the 20 years of research and practical experience of naval communications engineer Capt. Paul H. Lee, USN(ret), N6PL. Learn the basic theory, design, and practice of the vertical antenna. Discover easy construction projects such as a four-band DX vertical or a broadband array for 80 meters. Ever wonder how to build a functional directive vertical system? Paul Lee can get you started today!
Order No. VAH..... $9.95

Where Do We Go Next?

Ever dream about what it's like to go on a DXpedition? Have you ever imagined thousands of stations calling only you? No one can tell his story in a more compelling way than world famous DXpeditioner Martti Laine, OH2BH. Whether it's from the wind-mills of Penguin Island or the volcanoes of Revillagigedo each chapter conveys a unique story that you won't be able to put down.
Order No. WGN .....~~$22.95~~ SPECIAL.....$15.95

The Shortwave Propagation Handbook

There's simply nothing like it — the authoritative book on shortwave propagation. Developed by CQ propagation columnist George Jacobs, W3ASK and Ted Cohen, N4XX, The Shortwave Propagation Handbook is your source for easy-to-understand information on sunspot activity, propagation predictions, unusual propagation effects, and do-it-yourself forecasting tips. As an active ham, you can't afford to be without this one! **Order No. SPH $9.95**

Keys, Keys, Keys

Enjoy nostalgia with this visual celebration of amateur radio's favorite accessory. Written by the well-known author and CQ columnist Dave Ingram, this book is full of pictures and historical insight that only K4TWJ can provide. If you've ever wondered about the old days of Morse, this book's for you.
Order No. KEYS..... $9.95

Get Started with CQ's New Video Library!

Getting Started in Packet Radio

Getting Started in Packet Radio
Getting Started in Packet Radio shows you how to set up the necessary equipment and actually get on the air on Packet. No theory ... just the nuts and bolts of how to do it.

This video will help de-mystify the exciting but sometimes confusing world of packet radio. Learn how to get started using your computer on the radio. Included are step-by-step instructions on making packet contacts and using packet bulletin boards, networks and satellites. **Order No. VPAC.. $19.95**

Getting Started in Ham Radio

Getting Started in Ham Radio
Getting Started in Ham Radio walks the viewer through setting up the first station, including the antenna, and gets you on the air.

This is a fast-paced video introduction to the fascinating world of ham radio. CQ's experts show how to select equipment and antennas; which bands to use; how to use repeater stations for improved VHF coverage; the importance of grounding and the basics of soldering. How to get the most out of your station, whether it's home-based, mobile or handheld. **Order No. VHR $19.95**

Getting Started in Amateur Satellites

Getting Started in Amateur Satellites
A newcomer's guide through the equipment, the techniques and the jargon of satellite communications.

Learn with this video how veteran operators set up their satellite stations. Find out how to locate and track ham satellites with ease. Watch operators access current satellites and contact far ranging countries around the world. This video is filled with easy to understand advice and tips that can't be found anywhere else . **Order No. VSAT..... $19.95**

Getting Started in DXing

Top DXers share their experience with equipment, antennas, operating skills, and QSLing. You'll see hams work rare DX around the world. If you're new to DXing, this video is for you! All this valuable information may well give you the competitive edge you need to master the exciting world of DXing.
Order No. VDX..... $19.95

Ham Radio Horizons: The Video

This introduction to Amateur Radio is an excellent complement to the Ham Radio Horizons book. Enjoy seeing all aspects of ham radio ranging from what it takes (and costs) to get started to how you can get your ham license. Designed for the general public, HRH is ideal for public events, presentations to community groups and as an opening to your club's licensing courses! There's no better way to introduce someone to ham radio.
Order No. VHOR.....$19.95

For Fastest Service, Call CQ at (516) 681-2922
Or FAX 516-681-2926
Also available at your local dealer!

YES! I want to learn from the experts. Rush me my book(s)/video(s) right away!

Qty	Item #	Description	Price	S & H	Total Price

Please add $4 shipping & handling per item ordered. FREE shipping & handling for orders $50 and over.
Please make your check or money order payable to: CQ Communications, Inc.

Name _____ Callsign _____

Address _____

City _____ State _____ Zip _____

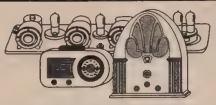
MC/VISA/AMEX/Discover # _____ Expires _____

Form of payment: ☐ MC ☐ VISA ☐ AMEX ☐ Discover ☐ Check ☐ Money Order

Please mail your orders to:

CQ Communications, Inc., 76 North Broadway, Hicksville, New York 11801-9962

FREE SAMPLE COPY!



ANTIQUE RADIO CLASSIFIED

Antique Radio's Largest-Circulation Monthly Magazine

Articles - Classifieds - Ads for Parts & Services
Also: Early TV, Ham Equip., Books, Telegraph, 40's & 50's Radios & more...
Free 20-word ad each month. Don't miss out!

1-Year: $29.95 ($44.95 by 1st Class)
6-Month Trial - $16.95. Foreign - Write.

A.R.C., P.O. Box 802-T8, Carlisle, MA 01741

VISA **Or Call: (508) 371-0512**

WORLDS SMALLEST FM TRANSMITTERS

NEW! POWERFUL! ULTRA-MINIATURE FM TRANSMITTER KITS

Surface Mount Technology (SMT) makes these the smallest high performance transmitters available anywhere! Use them with any broadcast FM receiver. Complete, easy to assemble kits with all SMT parts already assembled to the circuit board.

XST500 - Voice transmitter includes a super sensitive microphone to transmit voices at the level of a whisper up to a mile away.
XST500 ..... $44.95

XST500

XPS250 - Phone transmitter uses no batteries, attaches to your phone line, and transmits conversations up to 1/4 mile away.
XSP250 ..... $34.95

XSP250

VISA WE ACCEPT CHECK, VISA, MC, MO, OR COD ($ & H EXTRA)

MasterCard SATISFACTION GUARANTEED
CALL: 1-800-336-7389

ASK FOR CATALOG

XANDI ELECTRONICS - SINCE 1981
201 E Southern Ave, Suite111, Tempe, AZ 85282

CIRCLE 90 ON READER SERVICE CARD

CABLE TV DESCRAMBLERS
Best Prices in the U.S.A.!
Guaranteed to Work!

WE WILL BEAT ANY PRICE!

JERROLD PANASONIC
SCIENTIFIC ATLANTA PIONEER

The Newest & the Latest

DMTB-A - all Jerrold Impulse & Starcom series
SA3-DFA - all Sci. Atlantas incl. 8536, 8536+, 8580, Drop-field
PN-3A - all Pioneer systems

ALSO

FTB3, SA3, TZPC145G

24 HOUR SHIPMENTS
30 DAY MONEY BACK GUARANTEE
FREE CATALOG & INFORMATION

1-800-772-6244
M-F: 9-6 EST
U.S. Cable TV, Inc. Dept.: KPC103
4100 N. Powerline Rd, Bldg. F-4 Pompano Beach FL 33073
NO FLORIDA SALES!

CIRCLE 87 ON READER SERVICE CARD

FIND OUT WHY Scanner Enthusiasts choose **DataFile Software** for their scanner enhancements. Unique, powerful, affordable! DOS based. S.A.S.E. details. **DataFile, Box 20111 PC, St. Louis, MO 63123.**

NATIONAL SCANNING REPORT, America's #1 all-scanning magazine. Articles, frequencies, new products, more. One year subscription ($17.50) includes custom frequency print-out for your country. Order toll-free 1-800-423-1331. Sample copies $3.00 cash from Box 360, Wagontown, PA 19376.

WORLD'S MOST UNUSUAL Communications Books! A large selection of outstanding titles covering scanners, "confidential" frequency registries, bugging, wire tapping, electronic surveillance, covert communications, computers, espionage, monitoring, and more! New titles being added constantly! Ask for our big FREE catalog. CRB Research, BOX 56-PC, Commack, NY 11725.

R-390-A SERVICE: Module repair and alignment to complete remanufacture, new front panels, knob sets, VFO calibration, new filter capacitors, tubes, squelch modification, 20 years expert service, 2-week turnaround, very reasonable, any condition accepted. (419) 726-2249.

SPECTRUM DISPLAYS: Defense electronics SD-102, dual channel 10.7 input, solid state, 5" CRT, see 10 MC spectrum, use with any (2) scanners, like new. (419) 726-2249.

WANTED: Pre-1925 Antique **RADIOS** and parts. Also later models with 15 or more tubes, or bright colored cases. Matthew Kurzdorfer, 107 Falconer Street, North Tonawanda, New York 14120-6108, (718) 695-0036.

FOR SALE: ICR1 New $385.00; AEA CP1 Computer Interface w/Commodore 64 Software (New) $150.00; McKay Dymek DA100 Active Antenna $75.00; SBE Opti-Scan w/Instruction Book and Cards $100.00; Kenwood SP100 Speaker (new) $50.00; Handic 6 Channel W/T $35.00; Antenna Specialist VHF/UHF Pre-Amp $35.00; Gladding Islander AM/FM/MB/LW/VHF with RDF $35.00; Regency 8 Channel Crystal Scanner $25.00; Grove Spectrum Probe $25.00. John Lewitsky, 615 Main Street, Stroudsburg, PA 18360. (717) 629-3403.

RCI-2950 Modification Manual, Including power and modulation increase. Clarifier, receiver modifications. Operating hints and more. Parts included. $20.00 ppd U.S. Money Order. $25.50 COD (MO residents add $1.15 tax). Scott, PO Box 510408, St. Louis, MO 63151-0408. (314) 846-0252.

PRO 43, 39, 2026, 37, 34, 2006 800 MHz modifications. Well explained and illustrated steps: $12 each. A.P. 500 - Dineen, Apt. #300, Labrador City, NFLD, Canada A2V 1E6.

SELECTED SHAREWARE (MSDOS): Choice programs. All good. Many unusual. No disappointments. $1 each. Free catalog on disk. Restricted book listing included. **MENTOR PUBLICATIONS, Box 1549-P, Asbury Park, NJ 07712.**

HAM RADIO PROGRAMS (plus 100s of other applications). Low as $1.00 per disk. Send $2.00 for catalog and sample disk to: TRI-MI SOFTWARE, 517 Pine Brook Road, Eatontown, NJ 07724. (908) 389-1049.

NEW BC-2500XLT call!!! New BC-8500XLT call!!! AR-1500 with SSB-$469, AR-2800-$439, AR-3000A-$989, BC-200XLT-$245, BC-760XLT-$275, BC-855XLT with 100 memories-$225. CBs, shortwaves, antennas, books, more!! If you don't see it call for price quote! Free UPS shipping and insurance to 48 states! We ship COD daily and we take trades! Price sheets - $1.00. GALAXY, Box-1202, Akron, OH 44309. (216) 376-2402. Our 10th year!!

COM R-1 Mini, handheld scanner. Mint condition. $330. Call Steve, (203) 535-3070.

MacRadio. Macintosh tutorial program for New Pool Novice & Technician HAM License. $29.00 + $3.00 shipping (CA add $2.40 tax). Lightning Industries, 1806 Milmont Dr., #125, Santa Clara, CA 95035 (408) 942-7998.

WANTED HIGH PERFORMANCE? The "Great" CBs, necessary accessories, antennas of the "Golden Era." Special Schematics, Classic Tubes, Dynamite Xstrs. L.S.A.S.E. to: AC, PO Box 383, Buckner, NY 40010-0383.

HOW TO BUY A USED SHORTWAVE RECEIVER—$6 ppd. Complete catalog of Patriot/Right Wing books - $1. Bohica Concepts, POB 546-PC, Randle, Washington 98377.

SHORTWAVE + SCANNER computer service. ShortWave Paradise–2008 SW 15th Ave., Fort Lauderdale, FL 33315-1871. 6 mo $15.00, 1 yr. $25.00. Call our Computer system today! (305) 524-1035.

SCANNER MODIFICATION MANUALS. Cellular mods, adding channels, increase speed, increase battery time, remote control, frequency charts, transportable power, pictures and diagrams. **REALISTIC SCANNER MODIFICATION MANUAL** and **EAVESDROPPING FOR FUN AND PROFIT** combined. A collection of modifications for the PRO-43, PRO-39, PRO-37, PRO-35, PRO-34, PRO-2026, PRO-2022, PRO 2006, PRO-2005. ONLY $14. **UNIDEN MODIFICATION INSTRUCTION MANUAL** and **EAVESDROPPING FOR FUN AND PROFIT** combined. A complete collection of modifications for the BC100XLT, BC200/205XLT, BC855XLT, BC580/600XLT, BC760/950XLT, REGENCY 4020, 4030, TS-1, TS-2. ONLY $14. STARLITE MFG. INC. 4424 Clemice Ln. Montgomery, Alabama 36106.

SHERLOCK FREQUENCY FINDER Software. Works with HB-232 Computer-To-Scanner Interface. New feature packed version now records audio. S.A.S.E. for details. **DataFile, Box 20111-PC, St. Louis, MO 63123.**

FOR SALE: NRD 535D, Universal M-8000, AOC CM-335 Color monitor, sell as package only. All mint, original boxes, manuals and receipts of purchase, $2800. Call Mark, (203) 259-5417.

FOR SALE: CABLE TV DESCRAMBLERS/CONVERTERS wholesale outlet. All major brands. Money back gaurantee. One year warranty. THE CABLE CONNECTION 800-764-5400. DEALERS WANTED.

WANTED: WWII-1970 x-band radars/microwave, civilian/military-working or not. Test equipment, parts. SHF, BOX 10215, PGH, PA 15232-0215.

SCANNER! HAM, CB RADIO! REPAIRS. Maximum labor, $80. Most models, modifications, Dan Rupe (Telo-Technology), 1302 South Uplands, Camano, WA 98292. (206) 387-3558.

AR-1500 w/SSB $469, AR-2800 w/SSB $425, AR-3000A $989, BC-2500XLT call! BC-890XLT call! BC-200XLT $245, BC-760XLT $275, BC-855XLT with 100 memories $225. CBs, books, shortwaves, antennas, more! Free UPS shipping to 48 states! Price sheets $1. Buy/sell/trade. Prices subject to change without notice. Galaxy, Box-1202, Akron, OH 44309. (216) 3760-2402.

Motorola MT 500 four channel walkie, drop-in charger, new battery, marine freqs., 156.80, 156.70, 156.65, 157.125. $150 or swap for scanner with aircraft freqs or six meter rig. Mike Starr, N80VJ, (313) 797-4150.

PORTABLE SATELLITE COMMUNICATIONS SYSTEMS, COMSAT TCS-9000, up/downlink. INMARSAT telephone, data, telex, 106 pounds total. Excellent condition, complete documentation. (205) 826-0390.

CONFIDENTIAL, Catalog of Police and Investigation Equipment $2. INTERNATIONAL POLICE EQUIPMENT, Department PCM693, PO BOX 7638, Moreno, California 92552.

Kenwood R-2000 receiver $385 Realistic Pro 2022 Scanner $150. Send money order to David Van Densen, 888 East Shady Lane Lot, 241 Neenah, WI 54956, or call (414) 734-2437.

SHORTWAVE & SCANNER computer service. Shortwave Paradise, 2008 SW 15th Avenue, Fort Lauderdale, FL 33315-1871. Six months, $15, one year, $25. Call our computer system today! (305) 524-1035.

10m Books: **"The Ranger Cookbook"** (AR3300, AR 3500)—$15; "The Uniden Cookbook"—$20; "Uniden Updates (supplements)—$12; "The RCI Handbook"—$20. Inquiries: LSASE! Bud Stacey, KC4HGH, POB 907, Satsuma, AL 36572.

LOCATING, TRANSLATING SERVICE: Books, shop service manuals, journals. Will barter third world translation services, book forwarding. Waterproof pages optional. Specialties: Bio-medical, folk medicine, Celestial Navigation. $200 package. Bater with bible translators, Peace Corps, others. R.V. Engineering, PO BOX 734, Ottertail, MN 56571. (218) 367-2636.

DRAKE SPR-4 perfect condition. 25 Crystals for all international and marine bands. Manuals, noise-blanker, calibration crystal, 12-volt cable, Drake medium—wave antenna. $260, including shipping. John McCarthy, 345 Gray Avenue, St. Louis, MO 63119. (314) 962-3458.

NEW ICOM R7000, $1129, R72 $799, Yaesu FRG100 $519, Bearcar 760XLT $219, 200XLT $229, 2500XLT $359. Yupiteru scanners. Call for our new and used price sheets. Send $1 to The Ham Station, 220 North Fulton Avenue, Evansville, IN 47710. For orders and quotes, call toll free, 1-800-729-4373.

IPENNSYLVANIA CB'ers: Are you helping on channel 9 and don't belong to a national or hometown team? Then we are looking for you as a monitor. We are the HIGHWAY EMERGENCY LEAGUE OF PENNSYLVANIA (HELP). Join us in covering channel 9 in Pennsylvania. Write HELP, Box 4024, Harrisburg, PA 17111 for membership information. Membership is open from September 1 to November 1, 1993.

Bearcat 200XLT case, antenna, wall charger, manual, $150. Realistic PRO-30 antenna, wall charger, $75. Bob KE5ZY (210) 614-3920.

HEATHKIT FANS-The kits are gone, but a new illustrated 124 page book provides company history and the personal insights of many company oldtimers. A perfect gift. Only $9.95 postpaid from Heath Nostalgia, 4320-196th S.W., Suite B-111, Lynwood, WA 98036-6754.

ERAZ-A-LOG, the easiest way to keep your loggings updated! Convenient the easiest way to keep your loggings updated! Convenient 8 1/2 x 11 format allows for 50 listings, HF or Scanner frequencies, channels, service and notes. SAVE TIME AND PAPER! Just wipe off the channel information you wish to change, keep the rest of your loggings in place. Special marking pen included. Only $7.95 each; four ERAZ-A-LOGS, only $6.95 each. Riverwood Publishing Inc., P.O. Box 23183, Chagrin Falls, Ohio 44023.

WANTED: A schematic or copies for a **SBE Console V**, and also for a Radio Shack Realistic Mobile, model TRC-428 nine-scan. If you can help, please send info to Michael Gostas, PO BOX 241, Appleton, WI 54912.

WANTED: The following early model radios: Regency TMR-12 (high), TMR-1 (high), HX-1000, Sonar 2513 (high), and EF Johnson 8 channel scanner (high). Top dollar for any of the radios listed in good usable condition with AC cord. Contact: Tom Lake, PO Box 4137, Stn. B, Long Branch, NJ 07740. (908) 229-9302.

Advertisers' Index

AMC Sales, Inc. 20
A.R.R.L. 6,59
Ace Communications. ..... 19,80, Cov III
Advanced Electronic Applications. 7
Alpha Delta Communications, Inc. 60
Antenna Supermarket 29
Antique Radio Classified 78
Barry Electronics Corporation. 75
CB City International, Inc. 30
CRB Research 36,45
Cellular Security Group 45,61
COMMtronics Engineering 30,48
Communications Electronics 47
Communications Specialists 46
Consumertronics 17
DECO 75
Davis Instruments 45
Delta Research 52
Drake, R.L. Company 21
EDE 79
Electron Processing 53
Electronic Equipment Bank 1
Fisher, Carey 79
GRE America, Inc. 48
Gilfer Shortwave 4
HR Bookstore 63
Home Satellite Service 79
ICOM America ..... 39,Cov IV
Intensitronics 30
J & J Enterprises 61
Japan Radio Company. Ltd. ..... Cov II
Jo Gunn Enterprises 20
L & L Electronics 79
Lentini Communications, Inc. 70
MFJ Enterprises, Inc. 11
MARYMAC Industries, Inc. 76
MetroWest 76
Microcraft Corporation 14
MoTron Electronics 37
National Amateur Radio Assoc. 4
OFS WeatherFAX 75
OPTOelectronics 5,57
Percon Corporation 33
RC Distributing 17
REACT International 64
Radio Shack 15
Radioware Corporation 61
Republic Cable Products, Inc. 79
SGC, Inc. 53
Satman, Inc. 76
Scanner World USA 24
Scrambling News 79
Signal Engineering 36
Software Systems Consulting 46,52
Systems & Software Int'l. Ltd. 14
U.S. Cable 78
USRadio 9
Universal Electronics, Inc. 33
Universal Radio, Inc. 3
Vanguard Labs 76
Viking International 67
Virginia Beach Hamfest 39
Wilson Antenna, Inc. 17
Xandi Electronics 78
Yaesu U.S.A. 23

Reach this dynamic audience with your advertising message, contact Don Allen, N9ALK at 217-344-8653, FAX 217-344-8656

CABLE TV CONVERTERS
Save $100's
- All makes and models
- Quality Equipment
- Shipped within 24 hrs
- Years of customers complete satisfaction
- Free catalog

L & L ELECTRONICS, INC.
1430 Miner St. Suite 522
Des Plaines, IL 60016
VISA **1-800-542-9425** MASTER CARD
Purchaser Must agree to comply with all State and Federal laws.

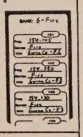
FREE CATALOG! 1-800-648-7938
JERROLD HAMLIN OAK ETC
CABLE TV DESCRAMBLERS
• Special Dealer Prices! • Compare out Low Retail Prices! • Guaranteed Prices & Warranties!
• Orders Shhipped Immediately! VISA/MC/AmEx
REPUBLIC CABLE PRODUCTS, INC.
4080 Paradise Rd. #15, Dept. 136 Las Vegas, NV 89109
For all other information (702)362-9026

CIRCLE 81 ON READER SERVICE CARD

PAY TV AND SATELLITE DESCRAMBLING
********1993 EDITION********
Includes programming cable box chips, hacking B-MAC, wireless cable (MMDS) descrambling, bullets, PLUS fixes and much more. ONLY $18.95. Other *PAY TV and SATELLITE DESCRAMBLING* volumes, Volume 1 (BASICS), 1989, 1991, and 1992. $15.95 each. Different turn-ons,bypasses, ECM's, schematics and counter ECM's in each. *THE COMPLEAT WIZZARD.* Using the VCII data stream. $15.95. Any 3/$32.95 or 5/$54.95. *SCRAMBLING NEWS* monthly. Keep up with the latest in satellite and cable descrambling. Everything that's new. $32.95/yr. *OUR BEST DEAL* everything here, the video and much more for only $129.95. New catalog $1.
SCRAMBLING NEWS, 1552P HERTEL AVE., #123
BUFFALO, NY 14216 Voice/FAX (716) 874-2088
COD's are OK. ADD $6

CIRCLE 83 ON READER SERVICE CARD

SCANNER DIRECTORY

This UNIQUE booklet style directory is made to stay with your scanner. It even slides into the case of the BC 100/200 ! No more fumbling through channels when the sirens start to scream!

To Order, Send Check or M.O. for $ 7.95 to:
C. Fisher, 3540C Miller Farms Lane, Duluth, Ga. 30136

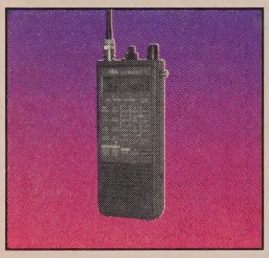
CIRCLE 111 ON READER SERVICE CARD

Satellite Systems
LNB's Actuators 817-367-0611 IRD's VCII+
Factory new products at discount prices.
Name brands such as "Houston Tracker" are available to you at great savings.
Home Satellite P. O. Box 4372 Ft. Worth, TX 76164

SURVEILLANCE
& COUNTER SURVEILLANCE Electronic Devices
Bugging/Phone Tapping Detectors • Phone Scramblers • Voice Changers • Caller IDs • Vehicle Tracking • Transmitters • Locksmithing • and more!
NEW! *7 hour telephone recording system. Tapes phone calls automatically. $125.00*
FOR CATALOG SEND $5.00 TO...
EDE P.O. Box 337, Buffalo, NY 14226 (716) 691-3476

ACE COMMUNICATIONS

Total Coverage Radios



AOR AR1000XLT

AM Broadcast to Microwave
1000 Channels

500KHz to 1300MHz coverage in a programmable hand held. Ten scan banks, ten search banks. Lockout on search and scan. AM plus narrow and broadcast FM. Priority, hold, delay and selectable search increment of 5 to 995 KHz. Permanent memory. 4 AA ni-cads and wall plus cig charger included along with belt clip, case, ant. & earphone.

Size: 6 7/8 x 1 3/4 x 2 1/2. Wt 12 oz.

Fax fact document # 205

$449.00

AR2500

2016 Channels

1 to 1300MHz

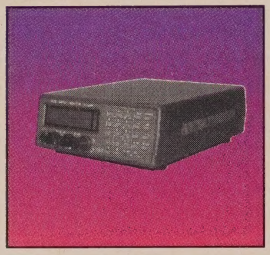
Patented Computer Control

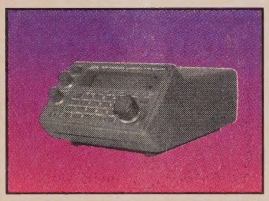
62 Scan Banks, 16 Search Banks, 35 Channels per second. Patented Computer control for logging and spectrum display. AM, NFM, WFM, & BFO for CW/SSB. Priority bank, delay/hold and selectable search increments. Permanent memory. DC or AC with adapters. Mtng Brkt & Antenna included.

Size: 2 1/4H x 5 5/8W x 6 1/2D. Wt. 1lb.

Fax fact #305

$499.00





AR3000

400 Channels

100KHz to 2036MHz Patented computer control. Top rated receiver in its class, offers AM, NFM Wide FM, LSB, USB, CW modes. 400 scan memories. 4 priority channels. Delay & hold & Freescan. AC/DC pwr cord and whip ant.

Size: 3 1/7H x 5 2/5W x 7 7/8D.Wt 2lbs., 10oz.

Fax fact document #105

$1195.00

AR2800

1000 Channels

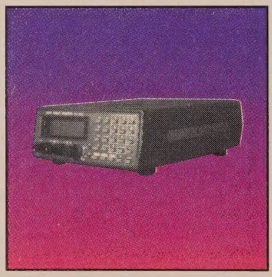
.5 to 1300MHz

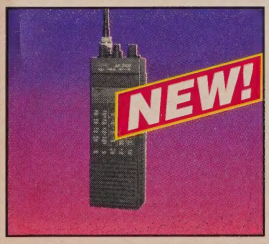
AM Broadcast to Microwave 1000 Channels 500KHz to 1300MHz coverage in a programmable mobile. Ten scan banks, ten search banks. Lockout on search and scan. AM plus narrow and broadcast FM. Priority, hold, delay and selectable search increment of 5 to 995 KHz. Permanent memory. DC or AC with adapters. Mtng Brkt & Antenna included.

Size: 2 1/4H x 5 5/8W x 6 1/2D. Wt. 1lb.

Fax fact #350

$449.00





AOR AR1500

Full Coverage with SSB
and 1000 Channels.

500KHz to 1300MHz. Ten scan banks, ten search banks. Search lock and store. BFO. 2 Antennas. AM/NFM/WFM. Selectable increments . Tons of features,

small size:
5 7/8 x 1 1/2 x 2.
Wt 14 oz.

Fax fact document # 250

$499.00

Scanners with Shortwave

Yupiteru 8-1300MHz Mobile or Hand Held Units.

$399.00 each.

MVT7000 MVT8000

Top rated receivers from Japan now available in the USA. Tune down to 100KHz. Sensitivity guaranteed from 8MHz up. 200 scan channels. AM/NFM/WFM. No gaps, no cut-outs. Mobile is super slim line. AC/DC. Order MVT8000, includes antenna, mbl mnt. Order MVT7000 for the hand held. Complete with Ni-Cads, Charger, antenna & earphone.

Fax fact document #275

New Bearcat mobile/ desktop offer continuous coverage of VHF/UHF/800 bands! The Bearcat 890XLTB covers 29-956 MHz with 200 channels, Turbo scan, WX search, VFO tuning, 10 priority channels and more! The Bearcat 8500XLTC covers 25-1300MHz in AM/NFM/WFM modes with 500 channels, turbo scan, 10 priorities, VFO tuning, and more. Fax fact documents 477 & 475.

Fax fact document #420

Bearcat 8500XLTC $389.00

Bearcat 890XLTB $259.00

Mobile Scanners

$209.95

Bearcat 760XLTM

100 Channel 800 MHz

Five banks of 20 channels each. Covers 29-54, 118-174, 406-512 and 806-954MHz (with cell lock). Features scan, search, delay, priority, CTCSS option, lockout, service search, & keylock. Includes AC/DC cords, mounting bracket, BNC antenna. Size: 4 3/8 x 6 15/16 x 1 5/8. Weight: 4.5lbs.

Fax fact document #550

Other Mobile Scanners

BC590 .....$159.95

BC560XLTZ $99.95

Fax fact on above: #560

Scan/CB/Highway Patrol/WX. X,K,Ka,Wide & Laser

$399.00

Trident TR-33WL

Scans police pre-programmed by state channel plus full radar and laser alerts in one small unit. Weather, CB receive & mobile relay.

Size: 5 5/8 x 4 7/8 x 1 3/4. Wt: 1.5lbs.

Fax fact #580

Other Pre-Programmed Scanning Receivers

BC350AS $129.00

BCT2 ..... $149.00

BC700AS $169.00

Fax fact on all above: #580

Hand Held Scanners

NEW!

Bearcat BC2500XLTA ~~$349.00~~

400 Channels 25-1300MHz

Hand held digital programmable receives in AM/NFM/WFM modes. Features turbo scan, WX search, VFO tuning, search, 10 priorities, lockout, frequency copy, frequency count, and more.

Bearcat 200XLTN $229.95

200 Channels 800 MHz

Ten scan banks plus search. Covers 29-54, 118-174, 406-512 and 806 956MHz (with cell lock). Features scan, search, delay, 10 priorities, mem backup, lockout, WX search, & keylock. Includes NiCad & Chrgr.

Size: 1 3/8 x 2 11/16 x 7 1/2. Wt. 32 oz.

Fax Facts # 450

Other hand held scanners

Bearcat 100XLTN 100Ch H/L/U $159.95
Bearcat 70XLTP 20Ch H/L/U.....$139.95
Bearcat 55XLTR 10 Ch H/L/U $99.95

Fax facts on all above: #475

Shortwave Receivers

ATS-818CS $224.95

16 Band digital receiver with programmable cassette recorder, BFO for SSB, AM/FM Stereo, 45 preset memories LCD display with dual time. Signal & Btt. strength indicator. Sleep timer & tone control.

Fax Fact #505

ATS-818 .....$194.95

Same as 818CS but without cassette.

Fax Fact #506

ATS-803A $174.95

The perennial best buy receiver. 16 band digital receiver with Am/FM/FM Stereo modes.9 memory presets. Auto/Manual and Scan modes. BFO RF Gain and Dual Filter controls. Complete with adaptors and headphones.

Fax Fact #507

ATS-808 .....$184.95

Compact size, great performance in a 16 band digital receiver. AM/FM/Stereo with 45 memory presets. LCD display with dual time clock. Complete with adaptors and headphones.

Fax Fact #508

ATS-606 $154.95

16 band ultra compact digital receiver with auto tuning and scan system. 45 memory presets cover AM/FM/Stereo. Dual time display, alarm timer,adjustable sleep timer.

Fax Fact #509.

ATS-606P $174.95

SG-621 .....$79.95

Compact 10 band receiver with AM/FM/Stereo. Analog tuning with a digital display.

Fax Fact #513.

ATS-800 .....$94.95

SG-631.....$99.95

10 band analog tuning with digital display which shows time and day for 260 cities throughout the world.

Fax Fact #511

SG-789 .....$54.95

10 band analog tuning. Super compact and very economical.

Fax Fact #512

SG-700L $49.95

12 band AM/FM compact portage analog receiver.

Fax Fact #514

Table Top Scanners

Bearcat 800XLX

12 bands and 40 channels with 800MHz and nothing cut out. AC or DC.

Fax facts #690

$209.95

Other Table Top Scanners

Bearcat 855XLTE 50Ch w/800 .....$159.95
Bearcat 142XLM 10Ch H/L/U $84.95
Bearcat 147XLJ 16 Ch H/L/U $89.95
Bearcat 172XM 20Ch H/L/U/Air.....$99.95
Bearcat 210 16Ch H/L/U/Air $129.95

Fax facts on all above: #675

*** Here's the fine print you've been looking for:**

$8.95 air freight is available for packages weighing 8 pounds or less sent to destinations within the Continental U.S. Overnight service is available to most urban areas at little or no surcharge. Outlying areas may require two days or more for delivery. Please call toll free if you have questions regarding ACE Communications radio receivers are manufactured under and/or licensed under one or more of the following United States patents. 3,961,261 3,962,644 4,000,468 4,027,251 4,092,594 4,270,217 4,455,679 4,461,036 4,627,100 4,932,074 5,163,161. AOR, ACE Communications and Yupiteru are trademarks of C.D. Corporation, an Indiana corporation. All other trademarks remain the property of their respective companies. We make no claims of ownership or interest to any trademarks other than those listed above. We make every effort to insure the accuracy of these contents, but disclaim responsibility for typographical errors. We make every effort to stay current, but prices & specs are subject to change without notice. Please call toll free to confirm prices, delivery and specs before you order.

Call Toll Free, 24 Hours A Day!

800-445-7717
Fax Facts 317-849-8683

Fax Orders 800-448-1084
Computer BBS Modem & Fax/Modem, 317-579-2045.
Toll Free Tech Support, 800-874-3468
International Fax: en Espanol, en Francais, und auf Deutsch, or just fax in plain English to: 317-849-8794

ACE COMMUNICATIONS
10707 East 106th Street, Fishers, IN 46038

Service & Support hours:

Mon.-Fri. 9AM to 6PM, Sat. 10-4 EST.

Mastercard, Visa, Checks, Approved P.O.'s & COD (add $5.50) & AMEX. Prices, specifications and availability subject to change. Flat rate ground shipping and handling charge only $5.95 per unit. Express Air only $8.95 , for most units, to most locations. One week trial, no returns accepted two weeks after original receipt without substantial restocking charge. All units carry full factory warranty. Indiana residents add 5 per cent sales tax.

Fax Facts Service

Get instant tech information Free from your Fax or Computer! You can obtain specs, freq. info, software and more from our automated services. For fax facts, call from your stand alone fax machine and follow the voice prompts. Use the BBS from your modem of fax/modem equipped computer. Dial 317-849-8683 for fax back service, or dial 317-579-2045 for our computer bulletin board service.

No fax, no computer?

Call our Tech Talker from your touch tone phone and hear automated messages giving you complete spoken detail on all of these products and more! Key in the Fax Fact number, or follow the prompts. Try it today! Dial 317 579-2047

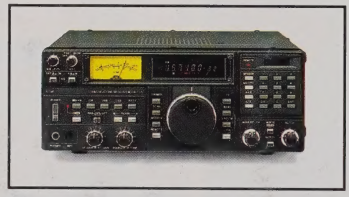
Fly It! $8.95

YOU EXPECT THE WORLD FROM ICOM RECEIVERS

ICOM's IC-R71A and IC-R7000 are the professional's choice for receiving international broadcasts, aircraft, marine, business, emergency services, television, and government bands. These people demand the finest in communications and so do you. ICOM puts the world at your fingertips with the IC-R7000 25-2000MHz* and IC-R71A 0.1-30MHz commercial quality scanning receivers.

Incomparable Frequency Control. Both the IC-R71A and IC-R7000 feature **direct frequency access** via their front keypad, main tuning dial, optional infrared remote control and/or computer interface adapter. **Incredible Flexibility!**

Full Coverage, Maximum Performance. The superb IC-R71A is your key to world-wide SSB, CW, RTTY, AM and FM (optional) communications plus foreign broadcasts in the 100kHz to 30MHz range. It features IF Notch, low noise mixer circuits and a 100db dynamic range. The pacesetting **IC-R7000** receives today's hot areas of interest, including aircraft, marine, public services, amateur, and satellite transmissions in the 25MHz to 2000MHz* range. It includes **all mode operation** low noise circuits plus outstanding sensitivity and selectivity. The IC-R71A/R7000 combination is your window to the world!



The IC-R71A is a shortwave listener's delight. Its **32 tunable memories** store frequency and mode information, and they are single-button reprogrammable **independent of VFO A or VFO B's operations!** Dual width, an adjustable noise blanker, panel selectable RF preamp, and selectable AGC combined with **four scan modes** and all-mode squelch further enhance the IC-R71A's HF reception!

The IC-R7000 features 99 tunable memories and **six scanning modes.** It even scans a band and loads memories 80 to 99 with active frequencies without operator assistance! Additional features include selectable scan speed pause delays, wide/narrow FM reception and high frequency stability.

Options. IC-R7000: RC-12 remote control, EX-310 voice synthesizer, CK-70 DC adapter, MB-12 mobile bracket. IC-R71A: RC-11 remote control, EX-310 voice synthesizer, CK-70 DC adapter, MB-12 mobile bracket, FL-32A 500Hz, FL-63A 250Hz and FL-44A filters.

See these quality ICOM receivers at your local authorized ICOM dealer today or call 1-206-450-6088.

*Specifications of the IC-R7000 guaranteed from 25-1000MHz and 1260-1300MHz. No coverage from 1000-1025MHz.

ICOM America, Inc., 2380-116th Ave. N.E., Bellevue, WA 98004
Customer Service Hotline (206) 454-7619
CUSTOMER SERVICE CENTERS
18102 Skypark South, Ste. 52-B, Irvine, CA 92714
ICOM CANADA, A Division of ICOM America, Inc.,
3071 - #5 Road, Unit 9, Richmond, B.C. V6X2T4 Canada

All stated specifications are subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. The ICOM logo is a registered trademark of ICOM America, Inc. Receivers793Y

ICOM®

Experience the Quality©

CIRCLE 68 ON READER SERVICE CARD